



Volume 3 Number 15

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August 7, 1984



# Framework And Symphony Face Off

## New Power For your IBM

**NewWord:**

WordStar Double  
At Half the Price

**Price Waterhouse  
Report:**

Great Plains Software



7 Programmable  
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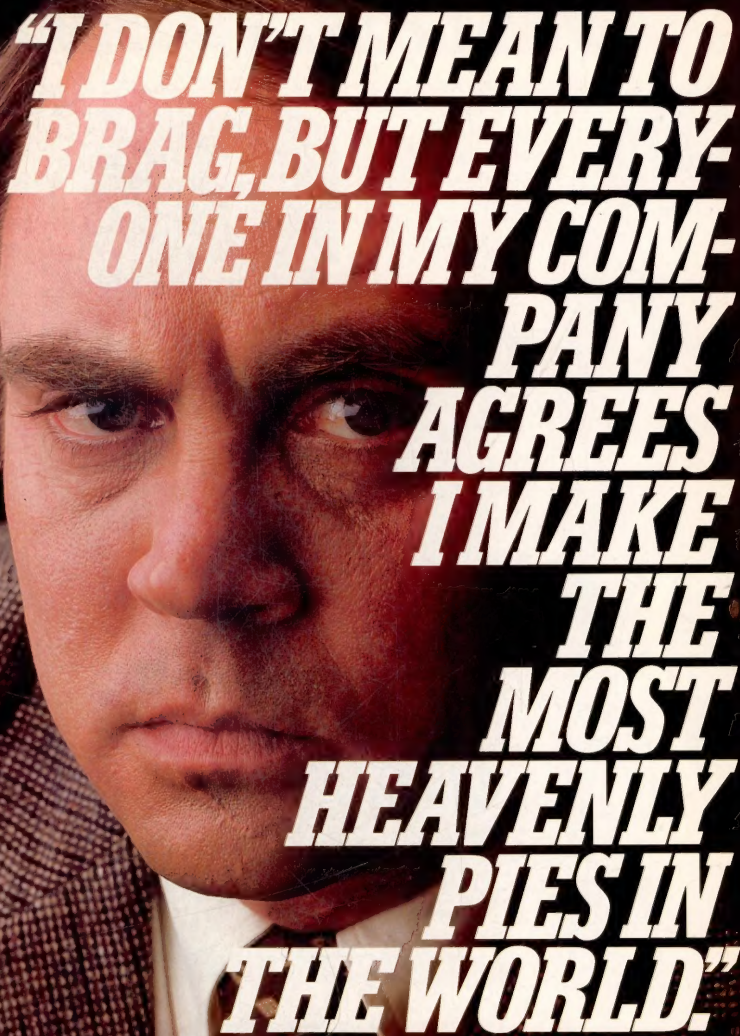
**Kaypro 4 Plus 88 and  
Sharp PC-5000:**

Two Paths to  
Portability

In PC News:  
Compaq's Desktop







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BRAG, BUT EVERY-  
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PANY  
AGREES  
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HEAVENLY  
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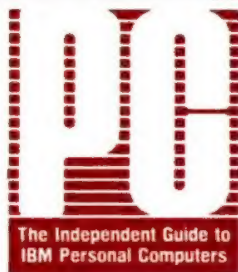
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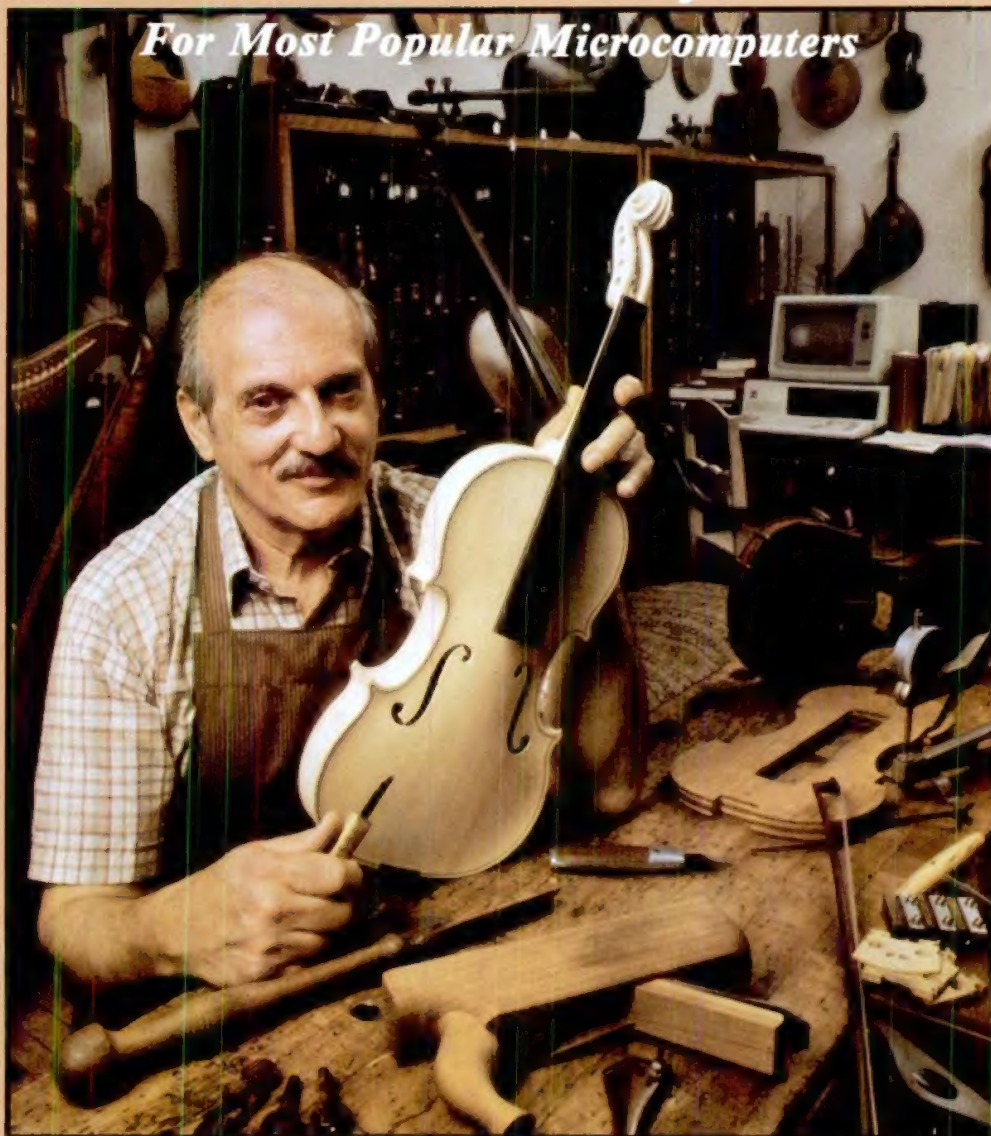


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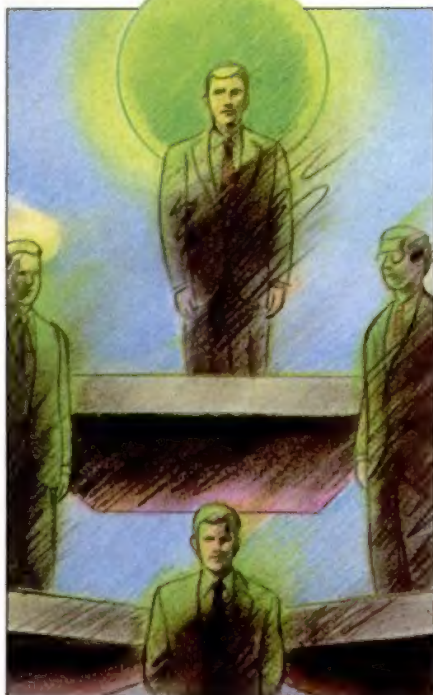
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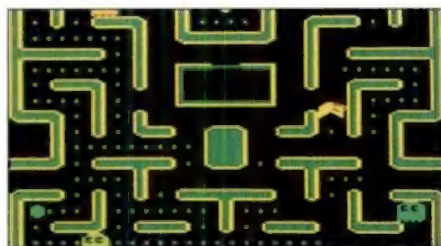
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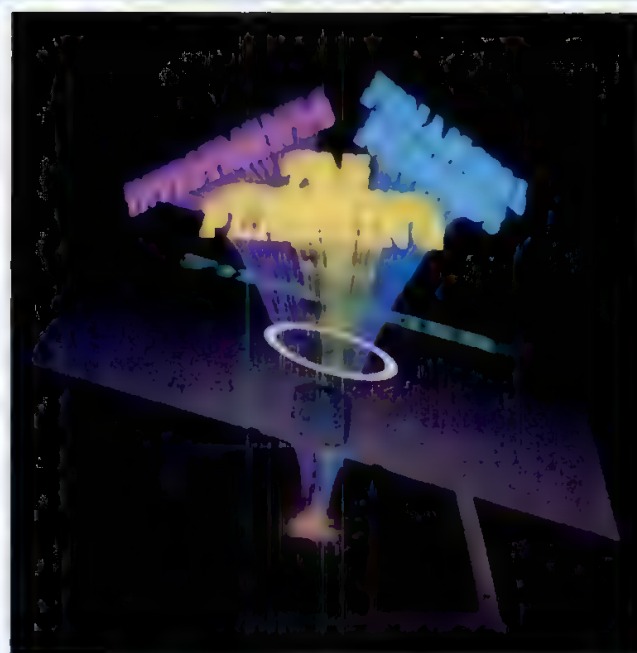
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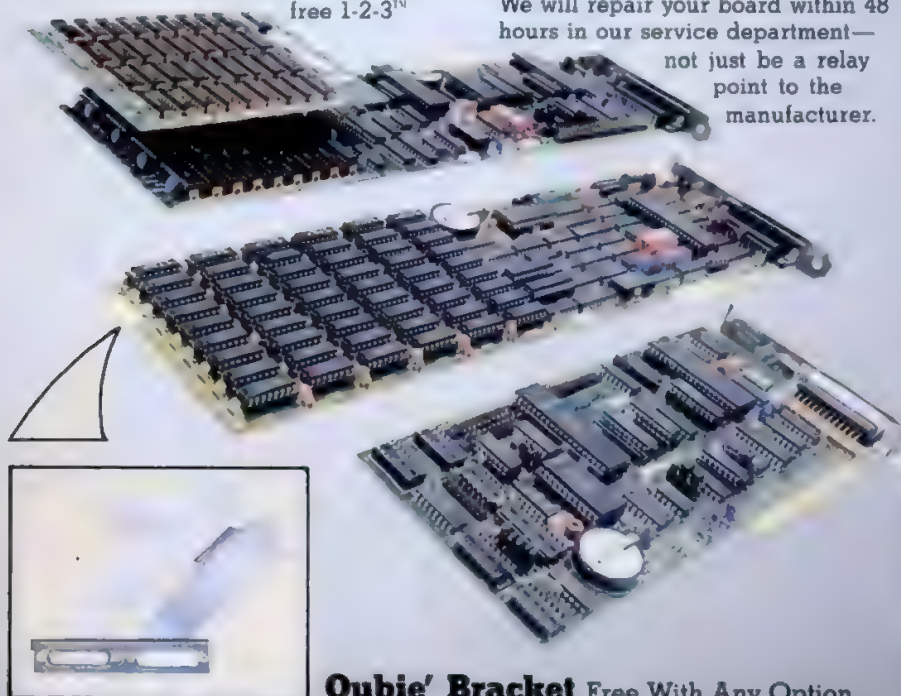
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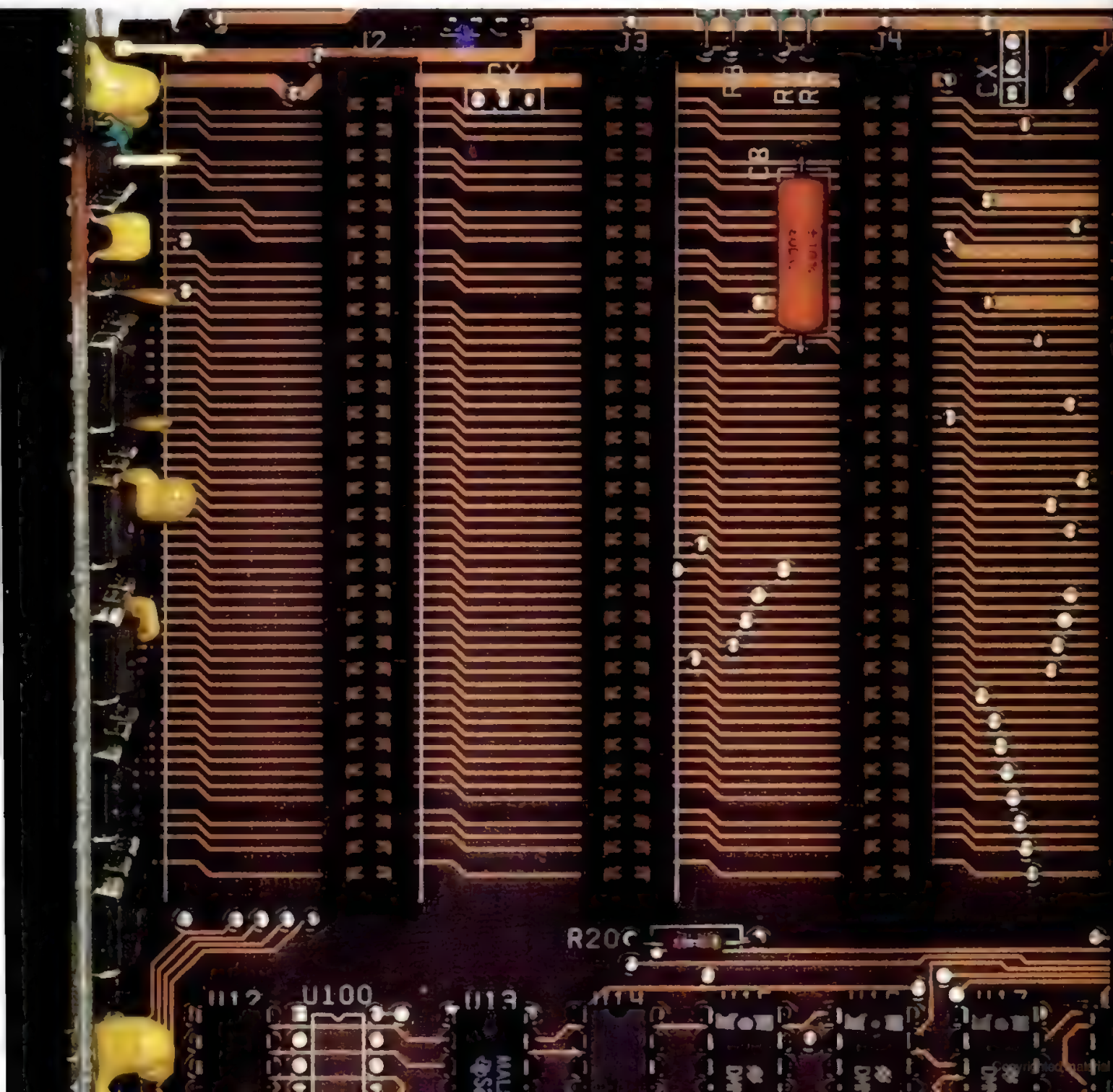
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IS WHAT TO PUT INTO  
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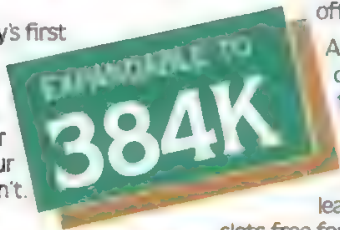




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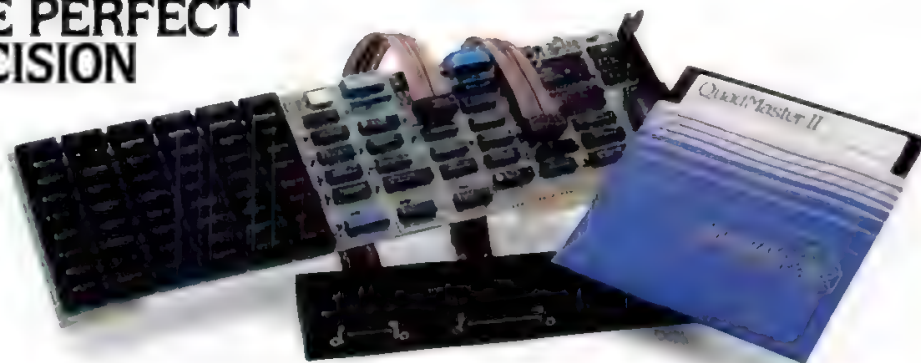
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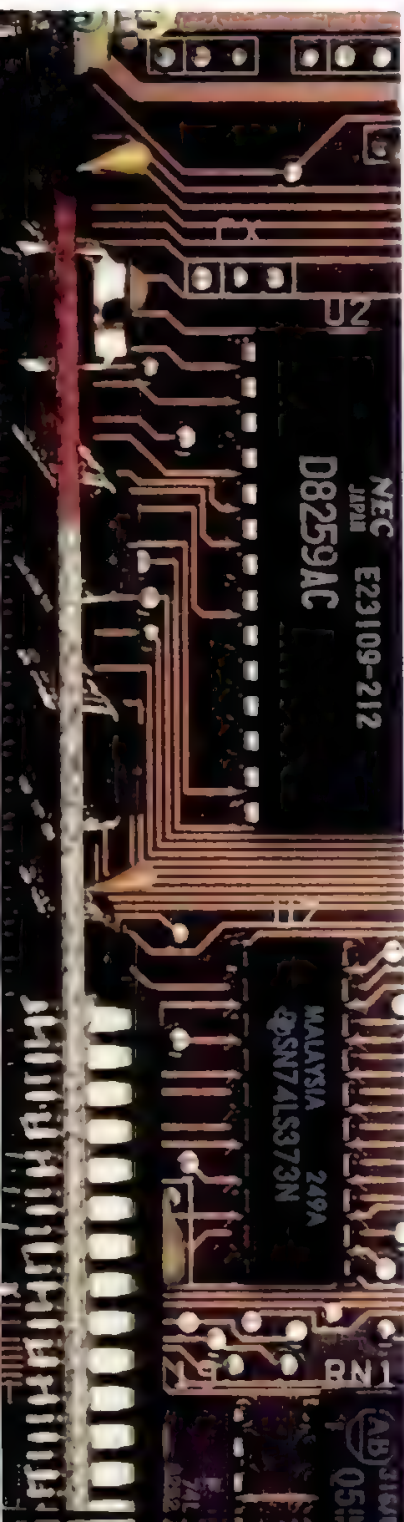
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# What's Inside

While PC's editors were making peace with the magazine's writers, a major battle was looming between Framework and Symphony, two new pace-setting integrated software packages.

All indications to the contrary, *PC Magazine* really does like its writers. Oh, we on the staff may nag them a little about style; we may drive them slightly berserk when we have to cut their original manuscripts to ribbons; and we may even cause them to suffer minor nervous breakdowns when we're forced to give them assignments with 3-day deadlines—but in spite of it all, we really do appreciate the trouble they go through to help fill our magazine every 2 weeks.

So, in an attempt to assure our writers that we are doing all that for their own good (and ours) the editors of *PC* decided to give a party—or, more appropriately, a short conference—at which all our assorted free-lancers could gather, meet each other and the staff of *PC*, and find out something about the in-house workings of the publication. After all, even if we do assemble the best technical writers around for *PC Magazine*, why assume they can't use a little improvement?

It all happened last May 21st, in the portals of New York City's nicely old-fashioned Sheraton Russell Hotel, replete with deep carpeting and dark wood paneling. Approximately 50 writers congregated in the Sheraton Room early on that Monday morning, loaded themselves up with pastry and coffee (you can't get a writer to come to anything unless there's something available to eat), and settled



down to about 5 hours of *PC* Day.

First, the members of *PC*'s editorial staff introduced themselves so that they would no longer be disembodied voices on the telephone. A little back-patting was offered by editor Bill Machrone and editorial director Jonathan Lazarus; then, we got down to business.

The assembled guests learned how the magazine is progressively put together by the writers, editors, art, and production; about how *not* to write an article ("I opened the package with trembling hands, my heart fluttering as I wondered what changes in my life the software would make . . ."); and about who our readers are and what they want out of *PC*.

Did all that good advice "take"? Will our free-lancers go home and do us proud? It's up to you to let us know.

## Cover Story

One of the main purposes of this column, of course, is to explain how our cover stories get to be our cover stories. Most of the time, the process is fairly simple and not terribly exciting: the heads of the editorial and art departments meet, go over what stories are upcoming, and try to decide which of them is worth featuring on the cover of *PC*. The process is very calm, cool, and correct, in the highest tradition of professional comportment.

This issue's cover story, on *Framework* vs. *Symphony*, however, was the result of a bit more excitement than usual. It all started when editor Bill Machrone got a phone call from Marty Mazner, the president of Forefront, the company that developed the first half of the cover story. "What would you think," asked Mazner, "of a product that does for people who use words what spreadsheets do for people who use numbers?" Machrone wanted to hear more. "It's a do-all product," he was told. "It can put documents in spreadsheets, put graphs in cells, intermix them, and then manipulate the whole thing."

Later, when Mazner and Rob Carr, the author of the program, brought *Framework* to the *PC* offices, it was assumed



## WHAT'S INSIDE

that, being just one of the hundreds of new software packages brought to our offices, it would be viewed no differently than all the other packages by special-projects edi-

tor Paul Somerson and Machrone.

But that wasn't the way it worked out. Around the office, everything stopped. Jon Lazarus was called down from the

administrative offices, and executive editors Mike Edelhart and Connie Winkler were quickly drawn into the office. They looked at the demos, went out to lunch, and then looked again.

Mazner also mentioned that *Framework* was going to have "some backing from Ashton-Tate." But nothing prepared us for the huge amounts of hype and marketing expertise that would be brought to bear on the product introduction.

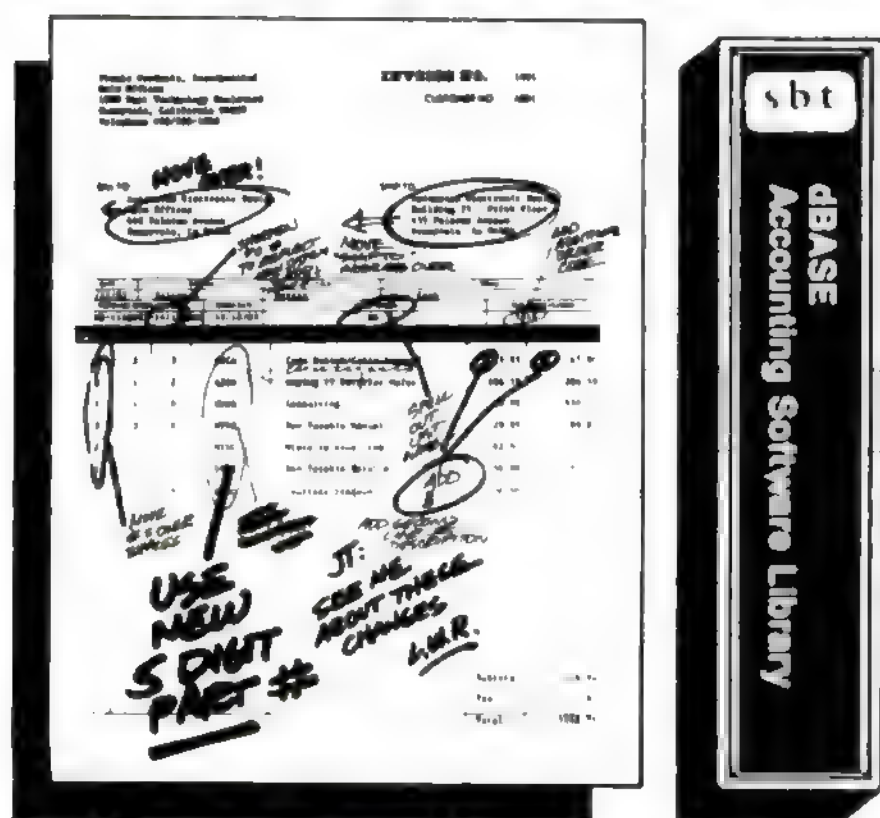
Meanwhile, around the time of the February Softcon, Lotus announced the introduction of *Symphony*, an expanded version of the company's popular 1-2-3 package. *Symphony*, too, was intended to set a new standard, and Lotus planned an elaborate ad campaign of its own (including Victor Borge and a symphony orchestra). Like *Framework*, Lotus' new program also stimulated interest and curiosity within PC's editorial halls.

We quickly realized that the competition between *Symphony* and *Framework* was going to provide software users with an interesting spectacle. This impression was solidified at Atlanta's Spring COMDEX, where the Lotus and Ashton-Tate booths were placed directly adjacent to each other in the main exhibit hall. The two companies squared off and glared at each other like two technological knights preparing for battle.

Intrigued, we set two of our best writers to the task of dissecting both packages and reporting on what they found. Don Layman, head of a computer consulting firm, had to finish his article on *Framework* at the same time he was racing to finish his reviews of Category 3 database packages. Meanwhile, Ed Baras, who took a close look at *Symphony*, was well acquainted with Lotus programming even before he took on the assignment—he already has a book out on using 1-2-3.

Which of the two integrated combatants will be left once the smoke has cleared? Or will *Symphony* and *Framework* both grab an appreciable part of the software market? Only time—and competition—will tell.

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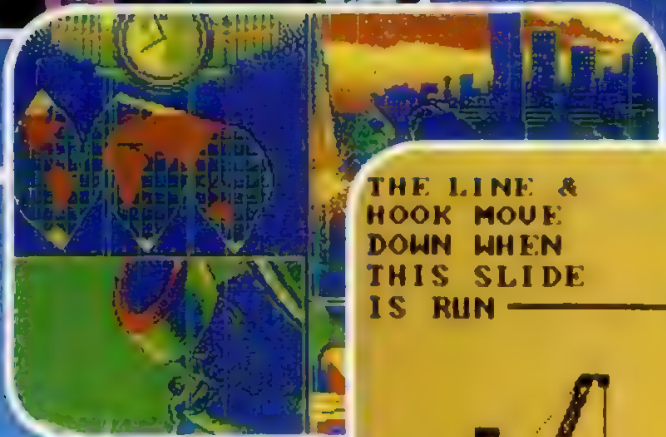


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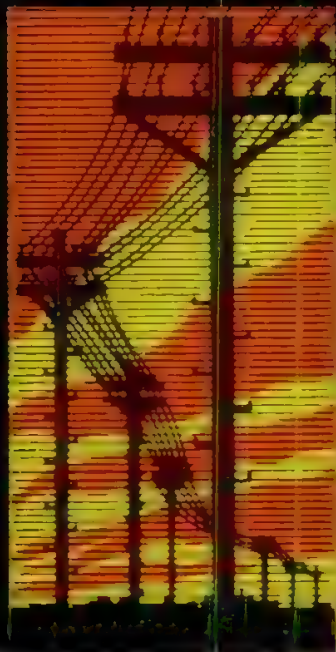
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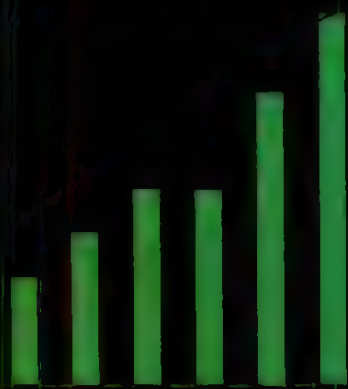
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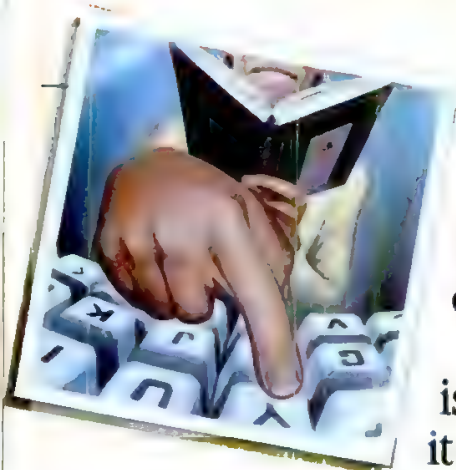
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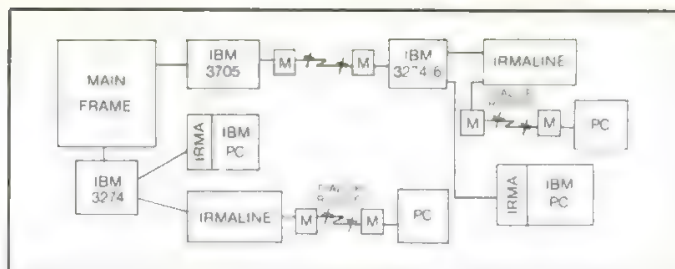
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# IBM News

FROM THE EDITORS OF PC

AUGUST 7, 1984

## Compaq Is Desktop Hit

Nifty touches—faster speed, tiny tape back-up, ultra-compatibility and comparable price—make latest Compaq what the PC should have been

BY BILL MACHRONE

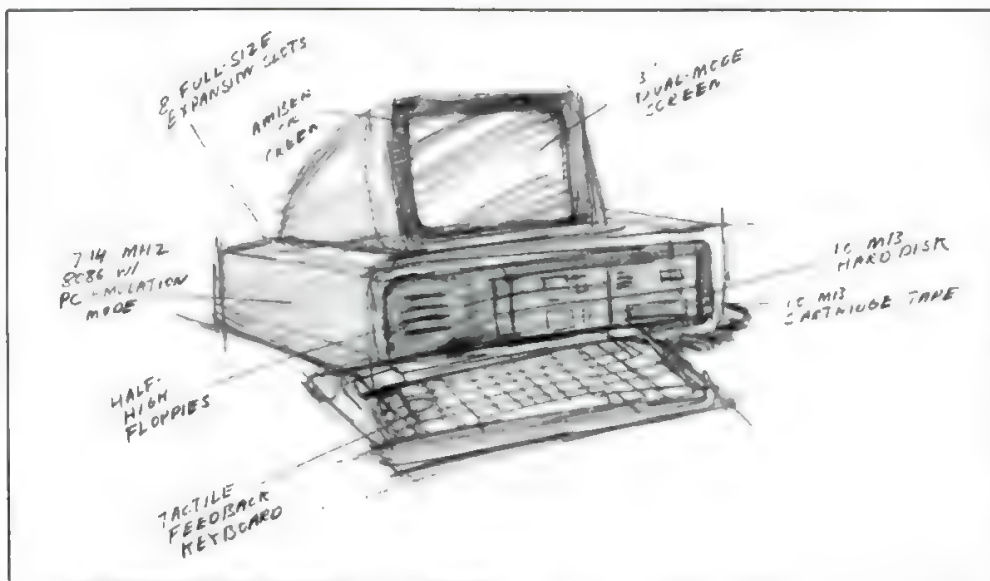
NEW YORK—Peter Norton said it best: "Compaq's new machine is what the PC-XT should have been."

The Deskpro, code-named "Bullet" during development, is a radical departure from Compaq's existing product line. First, it fits on a desktop; it isn't a portable. Second, it goes well beyond mere compatibility into new reaches of performance and functionality. On the outside, it's virtually indistinguishable from a PC-XT. On the inside, it's a whole new ball game.

The processor is an 8086 and it runs at 7.1 MHz, good for performance two to three times faster than the PC's. It has a slow-down mode that equals the PC both in clock speed and bus timing, so that clock cycle-dependent programs for the PC can run unaltered. In a wry touch, the LED pilot light on the front of the machine turns from its normal green to red when it enters the slow mode. There are eight expansion slots, and an 8087 socket. Deskpro is also available with a 10-megabyte hard disk and tape backup.

The 10-megabyte cartridge tape drive is an innovation not seen before on a personal computer. It uses the 3M mini-data cartridge format, much smaller than the standard data cartridge, and more reliable than digital cassette-based backup systems.

(continued)



## IBM Fires First Volley—A Biggie—In Price Wars

Compatible manufacturers scramble to match prices, and stay alive

BY DON KENNEDY

NEW YORK—For many in the microcomputer business, there was no "happy hour" on Thursday, June 7. At 5:30 p.m. that day, IBM made a dramatic move that gave consumers the best

deals ever available on its family of personal computers. The price cuts signalled the beginning of intensified competition that many analysts feel spells real trouble for some of the

companies now producing PC-compatible machines.

IBM made sweeping, deep cuts—18 to 23 percent—on the prices of each of the computers

(continued)



**Price Wars** (continued)

in its "PC family," the PC, XT, Portable, PCjr, XT/370 and 3270-PC. By also increasing the minimum memory of the PC from 64K to 256K bytes, the industry leader established new, lower pricing standards that makers of "work-alike" models could ignore only at great peril to their future.

The cuts came after heavy pressures on IBM stock on Wall Street. Throughout the week, the stock had traded at or near its low for the year, and rumors were rampant that price cuts were imminent due to sluggish retail sales of the whole PC line.

Although analysts estimate that revenues from the personal computer line constitute less than 10 percent of IBM's overall business, the perception of weak 1984 PC-family sales created a case of "the tail wagging the dog," as one industry insider put it. This, it was felt, explained the unusual timing of the announcement, which came after Wall Street and most East Coast offices had already closed.

Saying it was introducing "more cost-effective versions" of its hardware, IBM set the price for the new entry-level PC with 256K and one disk drive at \$1,995. A typically configured PC with disk drive and adapter and monochrome monitor and adapter would now list at \$2,420, a 23 percent reduction.

The XT with 256K, monochrome display and adapter was slashed from \$6,005 to \$4,920. The Portable was cut \$200 to \$2,595, and the enhanced PCjr with 128K and disk drive was cut from \$1,269 to \$999, with the 64K PCjr reduced from \$669 to \$599. There were similar reductions on most of the hardware options available for the PC family, as well.

Industry watcher Esther Dyson, president of EDventure Holdings, Inc., is one analyst who thinks the price cuts were "the wrong response to the sluggish market conditions."

**Shake-up Strategy**

"Clearly, IBM Corporate is unhappy with Boca's performance," she said, referring to the main site of the Entry Systems Division. "Don't just

stand there,' they [corporate headquarters] said, 'Do something!' So Boca did something, and, clearly, it's easier to cut prices than come out quickly with a new product."

Dyson feels, however, that in the final analysis, the problems that caused sales to be less than anticipated had little to do with prices and more to do with a generally sluggish demand for the PC, XT, and Portable combined with a poor perception of the PCjr. The price cuts, she said, are "not going to help IBM all that much—by cutting into their margins."

(IBM's mainframe Information Systems Group followed Boca's suit by making similar cuts on its PC versions.)

Other analysts pointed to the cost benefits of increased production and estimated little negative effect on IBM from the cuts. However, most were ready to predict negative, perhaps even traumatic, effects on competitors producing PC "work-alikes."

**Battles Begin**

"It's the first salvo in the bloodbath, which we believe is coming, but it's far from the last," said Douglas A. Cayne, analyst at the Gartner Group, a Stamford, Connecticut, research firm. It was his belief that IBM's competitors in the PC-compatible field would have to match or beat the new prices. He also believed that some of them lacked the margins to do it and still realize enough of a profit to remain financially healthy.

His predictions looked accurate in the days following the price cut announcement. Within 24 hours, Eagle Computer, Inc., Corona Data Systems, Inc., and Leading Edge Products, Inc., had announced their own price cuts on PC-compatibles.

In the following weeks, retailers responded with their own cuts. Sears Business Centers, for example, knocked an additional \$300 off the PC, XT, and Portable. "IBM has put the gleam back in the salesperson's eye," reported one happy customer in California.

George McMurtry, vice president of sales for Corona, explained that Corona had antici-

**IBM's New Prices****NEW 256K MODELS**

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PC 256K 2-360K Disk Drives	2,420
Portable PC 256K/2-360K Drives	3,020
PC/XT 256K	4,395

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PC/XT 128K	4,275	4,995
PCjr 64K	599	669
PCjr 128K/360K Disk	999	1,269

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Prototype Card	35	45
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Asynchronous Communications Adapter	100	120
Binary Synchronous Comm. Adapter	240	300
SDLC Communications Adapter	240	300
Diskette Drive Adapter	125	220
360K Diskette Drive	425	529
Monochrome Display and Printer Adapter	250	335
Printer Adapter	75	150
Fixed Disk Drive Adapter	590	695
PC Expansion Unit	2,880	3,390
PC/XT Expansion Unit	2,290	2,695
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Monochrome Display	275	345

pated the IBM price cuts. The cuts are "nothing out of the ordinary," he said, adding that Corona had sent its distributors a new price schedule about 3 weeks earlier. These reductions had been slated to take effect on July 16, but the Thousand Oaks, California firm was considering advancing that date in light of IBM's move.

Bill Sellers, vice president of market research and one of the founders of Leading Edge, said that the Needham, Massachusetts firm had been positioned to drop its prices, anyway, and had in fact changed their prices 10 days before IBM's announcement. He said the announcement of the lower prices for the Leading Edge PC had been delayed to allow the company time to prepare other announcements about new products, and its timing the day after IBM's announcement was

coincidental. Leading Edge also cut its stripped word processing software to \$100.

"We're following along on our own marketing plans," he said, and added that he anticipates few problems because his company's PC-compatibles are made by Mitsubishi, "which is even bigger than IBM." He did add, "Some American firms may be in trouble, though," and said that all IBM competitors would have to meet or undercut the new prices or risk losing sales.

**Eagle Responds**

Eagle Computer also dropped its prices 10 to 15 percent below the IBM price, and Ronald Mickwee, president of the Los Gatos, California, firm was reported as saying his company would survive because, as a smaller company, it can respond faster to the market than could a



corporate giant like IBM.

Nonetheless, there's little dispute that IBM's price cuts are going to put the squeeze on most competitors in a major way. Sellers predicted that companies like Compaq and Columbia will face particularly difficult times in the months ahead.

In the immediate wake of IBM's moves, however, Compaq, which has soared on the tails of IBM, held tight. "There's absolutely no change on the price of the Compaq," said Ken Price, director of communications. The typical 256K Compaq is about \$2,495.

Compaq believes IBM's new prices mean the computer giant is willing to come to the price point where everyone else is. And, the market is no longer willing to pay a premium for IBM's product, added Price.

Dyson anticipates the keenest struggle for survival will involve those companies that have based their strategies on pricing as a desirable alternative to IBM hardware. She says it will be a tough summer for "people like an Eagle and people competing on price. Even for someone like a TI."

Cayne's predicted "blood bath" looms on the horizon, and Dyson indicated the weapons that will be used. "If you play with price," she said, "they're going to come at you with price."

### Larger Systems

Cuts on the PCs that are connected to larger systems are complicated because of the various models involved. The XT/370 Model 568 dropped to \$6,230 from \$6,720 and the Model 588 with the 10-megabyte hard disk to \$8,085 from \$8,995. (The price for the XT-to-XT/370 upgrade kit remained at \$3,790.)

For the 3270-PC Model 2 (256K, display, disk, and keyboard adapter) the price went to \$3,785 from \$4,290. The Model 4 with 384K and printer adapter is now \$4,650 versus \$5,319 before, and the Model 6 with the fixed disk and printer adapter is now \$6,210 versus the earlier \$7,180. (Both Models 4 and 6 now come with 384K standard—instead of 320K.) ■

## Eagle Computer Toughs Out Creditors, Price Cuts

LOS GATOS, Calif.—Eagle Computer Inc. took two hard punches but stayed on its feet in its latest round in the PC-compatible ring. Whether Eagle goes the distance now depends more on the fans—the users and dealers—than on whether the company can placate creditors calling in \$10.8 million in unsecured loans.

Eagle executives were meeting with creditors the day IBM sliced 18 to 23 percent off its PC prices (it was the computer's low price that initially sent Eagle soaring in the last

2 years of PC-compatible competition.)

Eagle managed to calm the creditors and matched IBM's price cuts.

However, dealers the next week said they were hesitant to recommend the Eagle system because of the implications of the company's troubles. Genre Group, the chain of former XEROX computer stores, confirmed it was discontinuing the Eagle line.

Eagle took a heavy punch when it lost almost \$10 million in the third quarter (ending

March 31) this year because it could not deliver systems with BIOS (Basic Input/Output System) code acceptable to IBM. IBM Corp. lawyers demanded that Eagle's BIOS not infringe on IBM's copyrighted one, and Eagle agreed not to ship any product with the contested design.

It was well into April when Eagle resumed shipping product, including its new Turbo XL, an XT alternative that runs the Intel 8086 at either 4.77MHz (the speed of IBM's 8088) or 8MHz. ■

### Compaq (continued)

The drive, co-designed by Compaq and Irwin Magnetics, is manufactured by Irwin. It records eight data tracks plus a servo track. The servo track allows the head to adjust itself during playback to virtually eliminate misalignment. The drive uses the floppy disk controller to read and write to the tape, saving in parts and cost.

### Flexible Models

Deskpro is configured as four basic models, in which the major variants are amount of memory and number and type of mass storage. Model 1 comes with 128K and a half-high floppy disk. Model 2 has 256K and two diskettes, while Model 3 has 256K, a single floppy, a serial port and clock, and a 10-megabyte fixed disk. Model 4 rounds out the line with a full 640K, a floppy, 10-megabyte hard disk, the serial port and clock, and a cartridge tape drive. The Model 1 lists for \$2,495, while the Model 4's retail is \$7,195. Compaq knows that its prices are a few hundred dollars above equivalent IBM machines, but expects to compete successfully based on its products' quality, available features, and performance.

There are other features that make this entry more attractive to the business market. Compaq's famous dual-mode screen will be available in either green or amber and it will drive an optional RGB monitor. The keyboard, while adhering to the

IBM layout (Compaq executives feel that they are forced to use this standard by all the IBM-oriented documentation), will have a tactile feel somewhat like that of the highly regarded keyboard for the Texas Instruments Professional.

### Quintessential Compatible

Engineering director Gary Stimac claims that they have tested a great many boards, including 3Com's Ethernet, on the new machine and have, by and large, found everything to be compatible. Similarly, they have tested virtually every commercially significant software package and met with similar success. The software publishers worked with Compaq under nondisclosure agreements, but when asked about the performance of their products on the Bullet, their grins told it all. "I'm really not supposed to say anything," said one software company president, "but it's the answer to our dreams."

Product marketing manager Mike Swavely hinted that the Houston-based company, the most successful start-up company ever, has big plans for the Deskpro. "We are counting on it to be the base of a number of future entries and products," he said. President Rod Canion was more direct: "We intend to be one of the five major microcomputer manufacturers. The market can't support much more than that, and we intend to be firmly in that number."

Canion also discounted the rumors about a Compaq lap portable. "We looked at the designs and tried some engineering prototypes. But the market isn't screaming for LCD displays and there just isn't a viable low-power technology available yet. I doubt that you'll see a real, workable lap compatible until sometime after the first quarter of 1985."

The Deskpro was available in limited numbers through dealers the week following its June 28 announcement in New York.

### TI Roots

In some ways, the Deskpro is less the machine that IBM should have designed than the machine Texas Instruments should have built. There's still a long shadow extending from Dallas to Houston as the key players at Compaq work to cast off their TI heritage. Many of the policies and operating environments at Compaq exist solely because they are the antithesis of the way things were done at TI.

But Compaq's principals are beholden to no one but themselves for the clear advances that the Deskpro brings to personal computing. They made a point of asking their dealers, "What do you want from us?" The answers they got, desktop and higher-end machines, frankly surprised them. But they geared up, did some fast engineering, and planted a Bullet dead center into the business market. ■



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<sup>\*</sup>Cables available separately



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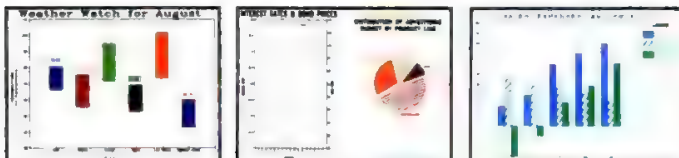
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CIRCLE 164 ON READER SERVICE CARD



# VisiCorp Repositions Its Products and Approach

With more tightly packed Visi On code, battered VisiCorp expands its line to fit floppy disks

BY JAMES LANGDELL

LOS GATOS, Calif.—After several months of sailing on turbulent waters, VisiCorp repositioned its cargo of software to help the company stay the course in today's PC market.

The latest maneuvers in VisiCorp's product line are possible because its programmers refined the software used in its Visi On environment. The new streamlined code (written in C), which VisiCorp claims is nearly 40 percent smaller than before, is used in an upgrade—called Performance Visi On—that will run faster on hard disk systems, as well as a new line, Floppy-Based Visi On, that fits Visi On, for the first time, onto a PC without a hard disk.

The Visi On mouse will also be enhanced by software, developed by Mouse Systems, that makes the mouse be a tool for creating *Macpaint*-style graphics, with color as well.

VisiCorp claims that its Visi On series, introduced at the end of last year, is still the only product line combining windowing and data transfer environment with applications programs tailored for that environment.

VisiCorp's chairman, Dan Flystra, admits that being the first is a mixed blessing. Now that its product has been used by customers for 6 months, VisiCorp used their comments and complaints to improve Visi On's performance. At the same time, Flystra told *PC Magazine*, users' and reviewers' criticisms have cast Visi On in the harsh light of reality, compared to the promotional glow surrounding products that are said to be equivalent, but have yet to be marketed.

Another disadvantage encountered by pioneers, Flystra

said, is that the terrain you reach isn't always what you expected. VisiCorp's original target for Visi On was to create a software environment that gave the less expensive (and less powerful) IBM PC system the same integrated features built into Apple's Lisa and the Xerox Star.

After months of development, Visi On met that target... but the target had moved. Users were initially excited by Lisa's integrated mouse and window features, but few bought the system because of its low speed and \$10,000 price. When Visi On was ready for customers, it was about as fast as the too-slow-for-comfort Lisa and cheaper. However, that wasn't enough to bring VisiCorp success where Apple had already failed.

Lisa, however, became a winner the second time around, when a faster, improved Lisa 2 shared the spotlight a year later with Apple's Macintosh. Now VisiCorp is giving Visi On a second chance, learning from experience to give users what they want.

## Waiting for Hardware

While Visi On's speed disappointed many IBM PC users, the software was better received by users of faster machines, such as the Wang PC. VisiCorp's new Performance Visi

On (also called Visi On 1.2) will be fast enough, Flystra claims, to allow an IBM PC to match the present performance of Visi On on the Wang PC—and the Wang's speed will increase that much more. IBM PC users may find that Performance Visi On now passes the "foot-shuffling test," in which they ask, "does the program keep me waiting, shuffling my feet, more than I can stand?"

Another setback that Visi On will attempt to overcome involves hardware. VisiCorp anticipated that, by the time Visi On was available, most IBM PCs would have hard disks, generous amounts of RAM, and mice as standard equipment. Although IBM had introduced its hard disk XT and many breeds of mice were available by the time Visi On appeared, few users had mice and hard disks were still beyond the budget of most users.

VisiCorp found that many users who considered using Visi On balked at paying another \$2,500 or more to add a hard disk and mouse to their computers.

To reach more users, VisiCorp is introducing a new product, Floppy-Based Visi On, which can be used without a hard disk on a system with two disk drives and a mouse. The

Floppy-Based Visi On Applications Manager software will be different from that sold for use on a full hard disk system, but the Visi On applications themselves (*Visi On Calc*, *Visi On Graph*, and *Visi On Word*, so far) are identical. The main difference in capabilities is that only one application can be loaded at a time, so disks have to be moved in and out of drives to switch between applications or perform data transfers.

## Floppy Versions

VisiCorp has not announced the prices for its Floppy-Based Visi On products, which were demonstrated at this summer's National Computer Conference in Las Vegas, but the company plans to have this new product line address mainstream business users of PCs. For the other ends of the market, its Visi-Series software is now priced within reach of home and small-business users with hardware worth about \$1,500, while the full Visi On is targeted at high-end business users with hard disk systems, representing at least \$5,000 of hardware.

Users who balked at buying a mouse just to run Visi On (about the only package for the PC that absolutely requires a mouse) will find the new Visi On Mouse makes a better case for being useful in its own right, thanks to a bundle of Mouse Systems' software. The mouse will include a *Paint* program, which adds color to Macintosh-like graphics powers, and a set of "Pop-Down Menus" that put the mouse to work with a number of specific products, such as *WordStar*, *1-2-3*, and *Multiplan*, in addition to *VisiCalc* and *VisiWord*.

Software developers also can gain from Visi On's new "less is greater" trend. A new Resident Toolkit, which can be used to develop Visi On applications programs, can run on a 512K IBM XT under PC-DOS. This puts Visi On development in reach of more programmers, who previously needed a 68000-based UNIX system that would cost at least \$12,000, and keep the developers in touch with the same hardware environment faced by users. ■

## Speaking of Computers: 'Do I Hear A Waltz?'

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# Ashton-Tate, Informatics Link PCs to Mainframes

**dBASE/Answer links to mainframes without giving DP director heart attack**

BY BILL MACHRONE

NEW YORK—If you can't beat 'em, join 'em. And if you *can* beat them, well, join them anyway.

That was the prevailing spirit in the joint announcement by Ashton-Tate and Informatics General. The product, *dBASE/Answer*, is an innovative link between mainframes and PCs.

Ashton-Tate's *dBASE II* has given a whole generation of data processing managers fits as users took matters into their own hands. Informatics' *Answer/DB*, meanwhile, has gained wide acceptance in the mainframe community as a flexible and facile report generation and database access tool. *dBASE/Answer* brings the two worlds together.

At the PC, the user creates a query or set of search criteria, prompted by help screens and an interactive query-generating facility that includes a data dictionary. *dBASE/Answer* then transmits the query to the mainframe, where it is executed. The host machine then transmits the subset of the file and fields that met the search criteria back to the PC. The receiving software builds a *dBASE II* or *dBASE III* file from the data as it comes over the line.

## Mutual Effort

While the companies have agreed to "co-publish" the product, it is primarily an Informatics effort, composed of two parts: a mainframe-resident communication and command interpretation module and a PC-based set of query generation and communication programs. It provides bidirectional communication between the personal computer and host, as well as file transfer, query, and search capabilities. The product con-

verts the output of file searches into formats that can be read by all Ashton-Tate products, including Framework. The conversion from the mainframe's EBCDIC character set to ASCII is handled at the mainframe end, while the actual creation of a *dBASE II* database happens in the PC.

This new product will be supported by both Ashton-Tate and Informatics General, with a combination of field sales reps and a specially-trained technical support team. Since this prod-

uct will be sold primarily to data processing and MIS managers, there is a heavy emphasis on control and security.

At the mainframe end, the database administrator in the large data center has extensive control over the databases available to *dBASE/Answer* and can further control access by user and workstation. Individual fields, and even ranges of data within fields, can be granted or denied access based on the user profile. For example, employees might be denied access to the salary fields of their bosses, but able to see salaries of subordinates. The product includes advanced features to protect itself against unauthorized access from stolen or copied disks.

## Looking Everywhere

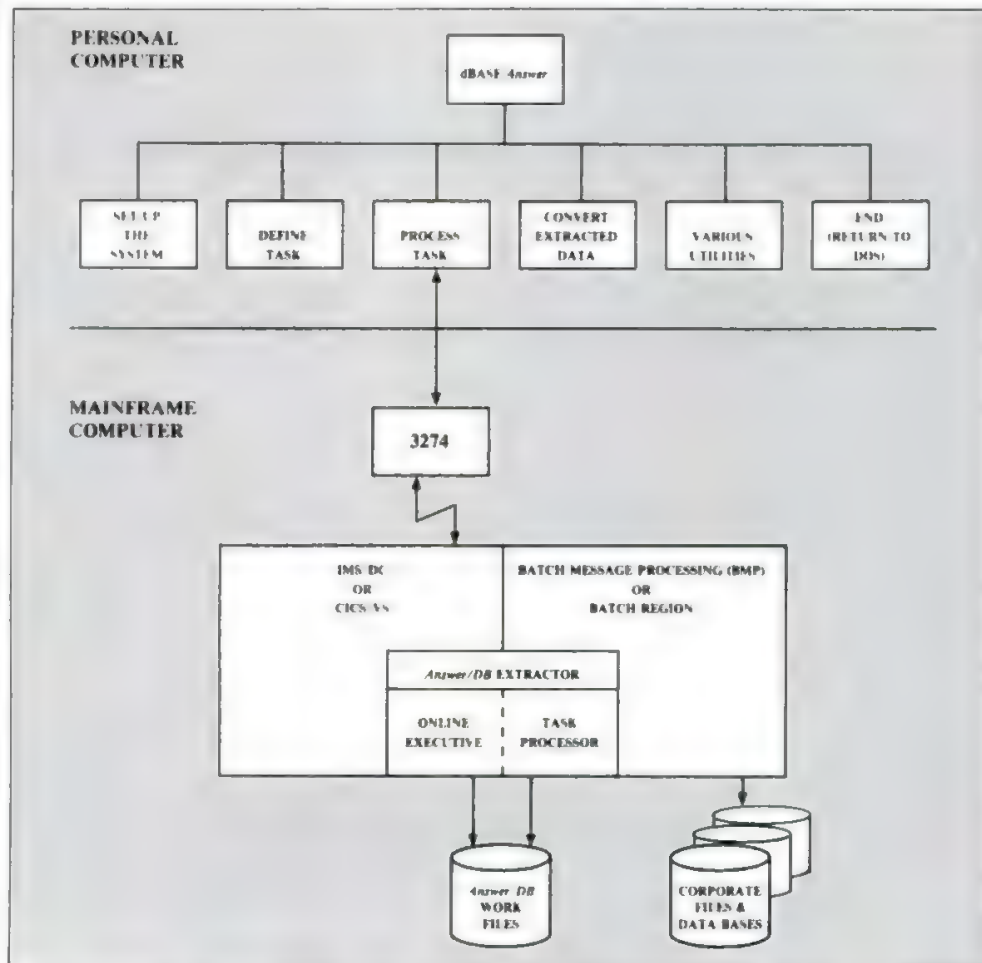
"Unlike existing micro-to-mainframe products," said Merritt M. Lutz, Informatics' vice president, "we're not selling applications, nor is *dBASE/Answer* application-dependent."

Indeed, *Answer/DB* can read virtually any kind of mainframe file, including IMS, IDMS, ADABAS, and VSAM. Installation of the package on a mainframe is reported to be less than 2 days' work.

"This product is perfectly positioned," stated David C. Cole, president of Ashton-Tate. "We've anticipated local-area networks and we've anticipated the corporate workstation." In addition to *dBASE/Answer*, Cole was referring to the multi-user version of *dBASE II*, available on 3Com's Ethernet LAN.

Last year, Informatics teamed up with VisiCorp to produce a similar product, *Visi/Answer*. It transfers mainframe data to *VisiCalc* files.

A typical *dBASE/Answer* installation, consisting of 50 PCs and one mainframe, will cost approximately \$45,000. The product has been beta tested in a number of large computer sites and is scheduled for release in late June.





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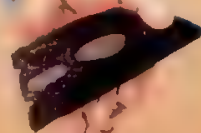


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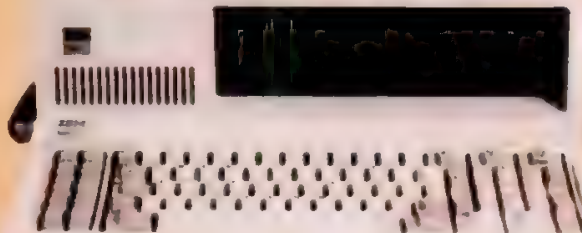
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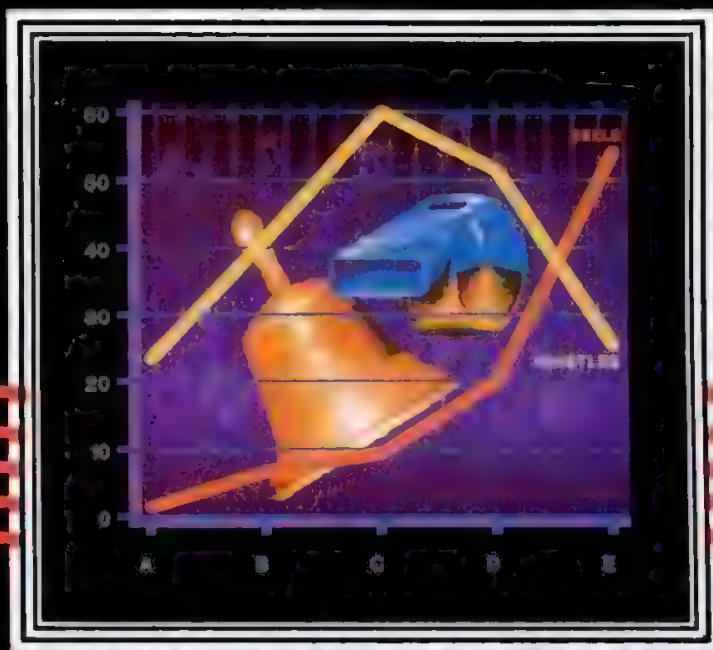
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# Keypads as Much Fun As Compatibles at CES

Canon hops on MS-DOS platform with packed \$2,500 compatible system

BY MARTIN PORTER AND PHIL WISWELL

CHICAGO—The computer game version playing at the recent Consumer Electronics Show (CES) here was the PC-compatible one. Canon announced they're on the bandwagon, and everyone else talked about getting on-board.

The Canon 16-bit, 256K MS-DOS \$2,500 system is expected in October and could be seen on the show floor running Lotus' 1-2-3 and Microsoft's *Flight Simulator*. The machine has two half-height Canon disk drives and is packaged with MS-DOS, GW BASIC, five I/O slots, standard serial and parallel interfaces, and a full 83-key, PC-lookalike keyboard.

Industry observers also expect Canon to announce a low-cost laser printer as part of their fall marketing push. Not on the floor, but previewed for software designers, was the Amiga Corp. PC-compatible, which the joystick company dubbed the "ultimate game machine," with a \$1,500 to \$2,000 price.

## Atari Talk

Atari discussed the forthcoming 1090 XL expansion system, which the company said would increase all Atari machine memories by 64K and allow them to accept up to five expansion cards. David Ruckert, Atari marketing director, said the slots could be used to make the machines "MS-DOS or CP/M compatible," defining the compatibility as "non-100 percent."

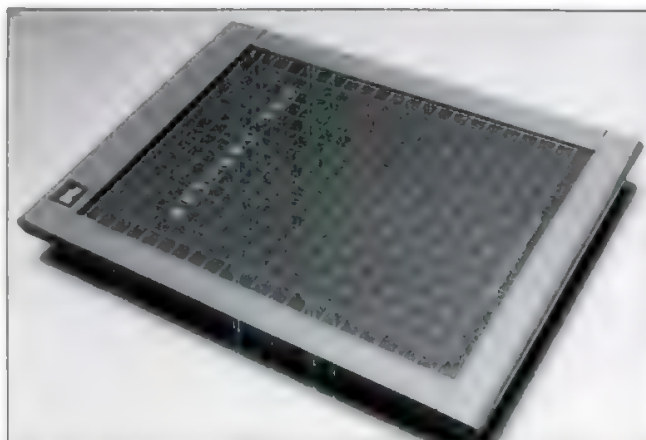
There were several new input devices:

- The Keypoint 300, which the company described as "a friendly computer input device," is a touch tablet with 300 squares or keys allowing the user to run complicated applications programs from the tablet with sin-

gle keystrokes. The initial \$299 package includes the tablet, three colorful plastic overlays for word processing, spreadsheet, and graphics, and the software that drives the tablet with these operations.

## Heart of the Product

The utility and beauty of the Keypoint 300 lie in the Keyware, the overlay/software combinations that facilitate the operations of programs such as *WordStar*, 1-2-3, and *Logo* as



well as BASIC. All available functions of the software being used are clearly labelled on the overlays, which eliminates the need for screen menus and prompts.

You don't have to memorize any CONTROL or FUNCTION keys, and you can run the programs with very little reference to the manuals. For example, deleting a row from a spreadsheet is as simple as pressing the key on the overlay labelled "delete row."

The Keyware for spreadsheet programs comes ready to run *Multiplan*, Lotus' 1-2-3, and *VisiCalc*, with more on the way from Polytel. Similarly, the word processing Keyware works with *WordStar*, *Word*,

and others.

The Keypoint 300 plugs into the joystick port of any game controller card, and measures roughly 9 × 12 × 1/2 inches.

- Suncom, Inc., also demonstrated a new touch tablet, the Animation Station, for drawing, manipulating graphics, and playing games at home. The \$150 rectangular tablet, measuring about 7 × 9 × 2 inches, is exactly proportioned to a television or monitor screen for optimal use of the drawing surface, unlike the Koala Pad. (However, the tablet will run all Koala software.)

## Power Buttons

The tablet has a grid pattern to aid placement of the plastic stylus when drawing, and every function is controlled by two buttons. Conveniently for left-handers, there is a set of buttons on both sides of the device. Uniquely, Animation Station

## No More Dullsville for Disks

FRESNO, Calif.—After you add a color display and color printer to your system, why not go all the way and add color to your disk drive? Most diskette makers have stuck to Henry Ford's Model-T philosophy that "you can get them in whatever color you want, as long as it's black," but Centech diskettes are now available in 13 colors from American Media and Supply, a company headed by Kelly Black in California's Central Valley.

The first bloom of colored diskettes included five bright colors: fire-engine red, canary yellow, sky blue, bright orange, and leprechaun green. If these sound too flashy for your desk, Centech disks now also come in five subdued hues for business environments: brown, tan, maroon, dark blue, and gray. Just as some ice cream stores list chocolate, vanilla, and strawberry as an afterthought, the three remaining disk colors are black, white, and a lavender that "is so bright that I'm surprised anyone buys it," says president Black.

At first glance, putting color on diskettes seems as frivolous an enhancement as painting candy stripes on perforated (the official name, by the way, for the perforated strips on tractor-feed printer paper). According to Black, however, nearly every customer has a different problem that a little color would solve.

An individual can use different colors to tell program disks from data disks, to identify different drafts of a document, or to identify data from different months or regions. A teacher could see across the room to tell if students are all using the right disk.

Where several users share the same machine, they can keep their disks separate by each using a different color (a meeting to decide who uses

(continued)



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Lattice C is a full implementation of Kernighan and Ritchie, not a subset, and even offers extra features such as nested comments, 39-character variable names and extra compile time checks for some of C's subtler errors. The compiler comes with a full library of I/O routines which implement under MS™-DOS most of the Unix-compatible standards described by Kernighan and Ritchie.

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Lattice C offers a choice of four memory models which allow the program designer to choose the right combination of efficiency and size for an application: a range between 64K and a full megabyte for program and data area size.

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It has a format mode for tab setting or wraparound and shaping when it's time to write documentation. Pmate lets you assign chains of commands or strings of text to single keys: one keystroke could set up the entire shell of a new C function, for example.

Pmate has variables, if-then statements, loops. It calculates, and converts decimal to hex to binary and back. You can write compact programs (called "macros") to delete comments, for example, or check syntax, or process long sequences of commands. Macros can alphabetize lists, do row and column math, perform a series of operations on multiple files, even summon other macros.

Put another way, Pmate is a text editor with its own built-in interpretive language. A language you can use to completely customize this text editor to your fancy. Possibly the most artful, ingenious program you have ever seen.

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It's a long list of capabilities which make for an extraordinarily powerful product. In fact, Halo is so good that manufacturers of graphics boards and systems are adopting it as a standard graphics language. So it can bridge your application to other systems. CAD-CAM developers, especially, have embraced its device-independent approach for maximal portability.

Halo is a dazzling demonstration of why C has become the language of choice among programming professionals: its function library architecture means you can tremendously enhance your firepower by acquiring libraries of software like Halo with dramatic economy of time and money.

Requires IBM monochrome or color graphics card or equivalents.

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## PLINK86

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**S**oftware is becoming ever more sophisticated, which means more complex programs requiring large chunks of memory. But if you use extra memory, if you count on users to have expanded RAM, you will forego sales to those who do not.

Plink86 is the answer. It takes on the job of shoe-horning large programs into small memory. First, Plink86 acts as an alternative to DOS' Link. For a language like C which encourages design of separately compiled object modules in the Microsoft relocatable format, Plink86 pulls modules together into single compiled programs. But Plink86's overlay power is what has gained it a reputation as a miracle worker. It binds into the compiled program its overlay manager which knows how to swap modules of your large linked program between disk and memory, so that each can temporarily occupy the same memory space.

Unlike other linkers, the overlay manager acts on its own, needing no calls from the source program. Instead, Plink86's straightforward overlay description language allows you to describe your overlay structure in one place in your program — a structure



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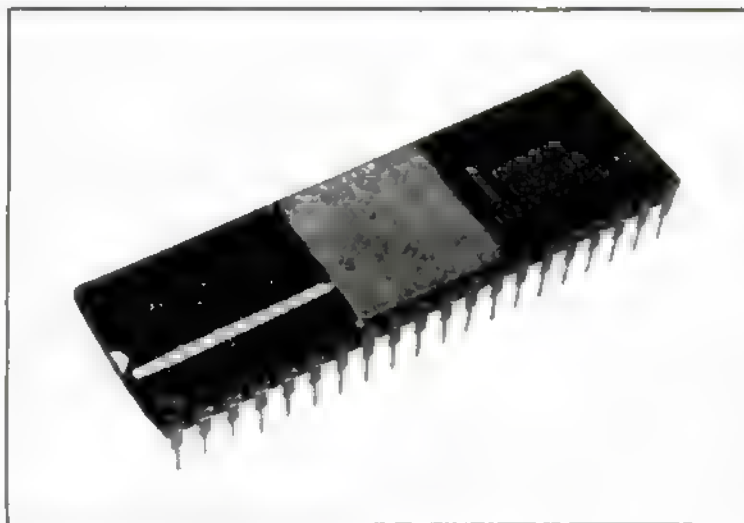
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# Preview Pak Gives You Try Before Buy—Sort of

Demos at the price of blank disks in this no-risk software sampler

BY JAMES LANGDELL

SAN FRANCISCO—"First select the software, then select your hardware," is a rule suggested by many computer consultants. Now Preview Publishing Co. proposes an amendment: "First select the disks, then select your software."

That's the philosophy behind this company's Preview Pak—a package of ten BASF Flexy-Disks, priced as if they were blank. You could use DOS to format them, store data on them; and never realize that each disk had been ready to demonstrate an IBM PC software package.

## Hidden Talents

But, surprise! If you stick around to see the Preview Pak disks strut their stuff, you'd see a very mixed bag of program types. The ten demos in the first edition of this sampler includes a spreadsheet (*SuperCalc*), word processor (*Palantir*), database manager (*Personal Pearl*), personal and business accounting packages (*Personal Accountant* and *Solomon Series*), computer aided drafting (*AutoCAD*), and sales training (*The Sales Edge*), as well as a windowing system (*InSight*), and versions of the UNIX operating system (QNX) and the FORTH language (PC/FORTH). A booklet with several pages of information on each program—and rebate coupons worth up to \$50—is included in the sturdy plastic ten-disk box.

Demo disks haven't been established yet as a major way for users to learn about software. Columnist John Dvorak—who is not easily amused—says the basic problem is that "demos are boring." Actually, most programs aren't very interesting in themselves—what's interesting is the work you create. The software you use fades into the

background of your attention.

A demo that relentlessly labors at fictional tasks can't compete with an episode of "Hill Street Blues" for pizzazz. But if a demo lets you run a program close to the way you might actually use it—you could easily spend an interesting hour deciding if you wanted to bring that software into your life.

The quality of the demos in the first Preview Pak varies greatly. The difference is worth looking at, even though a demo's quality doesn't necessarily reflect the quality of the actual package. Some demos provide free use of almost complete versions of the programs; these were well designed for the Preview Pak user who sits down one-on-one with the demo.

Not as useful were demos that repeat simulated runs of a program, interspersed with advertisements for the product. These canned demos were obviously designed to run in booths at computer shows, so they feature a few flashy screens that try to catch the attention of strolling customers for at least 3 seconds.

## Meet the Demos

In the first Preview Pak, the demo for *SuperCalc* tells you about the program, but also lets you do everything with it except save data files and use a printer for output. The *Palantir* word processor demo also lets you do everything—even print—except save your texts on a disk. If you never write anything but first drafts, this *Palantir* demo is the only word processor you'd ever need. A steal!

The demo for *InSight*, a window managing system merely took the disk's own file directory, fit truncated parts into four windows, and did some flashy screen choreography as if those windows were the June Taylor

Dancers. Did the canned demo give any indication of how the windows might be used in actual work, or even what applications could fit into the windows? Well, no. But when I hit Ctrl-Alt-Del to make the demo go away, the screen action merely paused and I found my keystrokes entered text in one of the windows. I experimented further and found that I could switch the cursor into any of the four windows to enter text. Unfortunately, neither the booklet, disk, nor randomly punched keys revealed anything else I could do with *InSight*.

The PC/FORTH demo doesn't show how to program with the FORTH language. Instead, it presents spectacular color graphics that show how fast programs written in FORTH can run. One sequence has a map of the world crossing the screen as if it was the spherical surface of a smoothly turning desk globe.

The first part of *The Sales Edge* demo lets you answer a series of questions about yourself and a potential customer, as in the real program, but the report the demo prints out is a canned text, which isn't influenced by your input.

## Ten a Month

Preview Publishing plans to release a new Preview Pak every month, each with ten demos of different types of programs. According to Preview Publishing's marketing head, Dan Logan, editions of Preview Pak are booked solid into 1985 by manufacturers who want to distribute demos. Many software makers are creating demos of their products for the first time, now that Preview Pak provides a way to get their disks to interested users.

If you'd like to try the Preview Pak demos, or merely want a different source to increase your stockpile of spare diskettes, a box of ten double-sided disks costs \$39.95 (plus \$3 postage and handling). Subscriptions are \$257.50 for six monthly issues or \$515.40 per year. Contact Preview Publishing Co., P.O. Box 590359, San Francisco, CA 94159, (800) 443-0110 ext. 330A. ■

## Dullsville (continued)

what color might be like the start of a Parcheesi game). A major bank, for example, now uses different colored disks in different departments. An insurance company with several incompatible machines provides disks of different colors for each system (perhaps red for Apples, blue for IBMs, and the yellow disk of Texas for TRS-80s).

Some software manufacturers sell their programs on Centech colored disks to discourage piracy by making the official disks more distinctive. One software company uses colored disks for in-house work to keep prototype versions of software from getting mixed up.

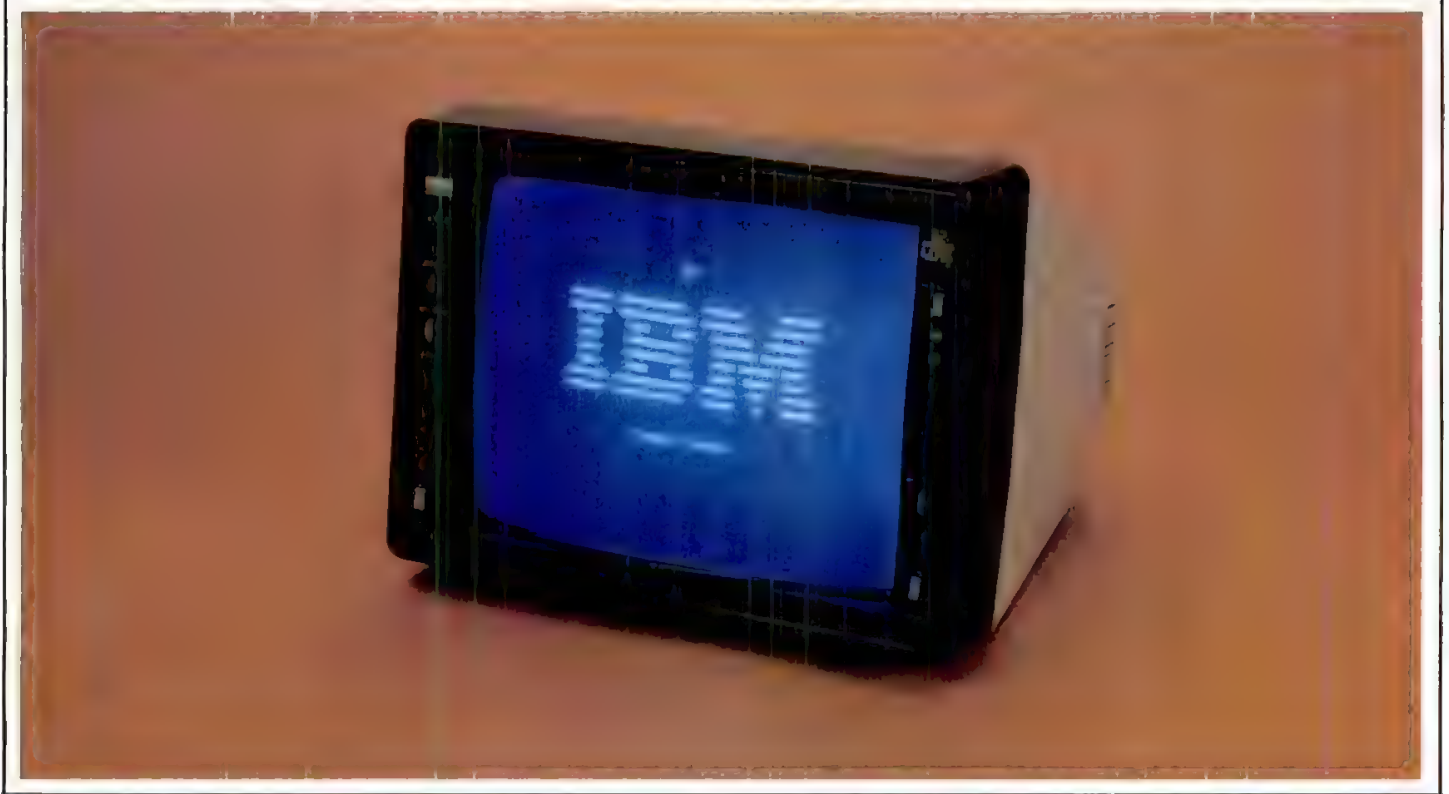
## Color Quality

Are colored diskettes as good as the standard black models? Black claims his company sought out better than average materials and processing for its Centech disks, using 8.5 mil homopolymer material for the sleeves. "Anyone could put color on crummy diskettes," says Black, "but they'd still be crummy diskettes."

We've put the Centech disks through a few weeks of normal use with no ill effects, but haven't had a chance to do specialized tests that might show if fire-engine red disks run fastest or if leprechaun green disks hide valuable data on tracks following an end-of-file symbol.

To put some color into your drives, Centech disks are available in packs of ten disks. If you can't decide which colors you want, try the Rainbow Mix with two each of the five bright colors or the Business Mix with pairs of the five tamer tones. The list price for ten 5¼-inch double-sided disks is \$45 (\$36 for single-sided). Colored 8-inch disks are also available. For more information on Centech diskettes, contact American Media and Supply, 5769 N. Palm Ave., Fresno, CA 93704, (209) 431-1133. —James Langdell





## RGB-1400 FEATURES

- 700 Lines Resolution
- Super High Contrast/Non-Glare
- 32 Colors Selected from 4,096
- Selectable Color Sets
- Front Access Calibration/Control
- Test Signal Performance Verification
- RGB-Digital/Analog
- Compact Cabinet Design

The design of the RGB-1400 color display departs from the tradition of modified TV circuitry. The design concept is total....encompassing the cabinet, heat extractor, circuit and control functions. A custom set of IC's has been designed to function with high speed video amplifiers driving a high performance CRT to provide the fastest, cleanest, purest color available in personal computer display history.

The RGB-1400 incorporates an Interface concept that allows a variety of analog and digital signal compatible features.

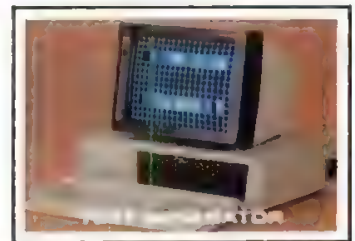
Color selection is PROM controlled and can be easily changed. PROM selected colors are displayed in the TEST mode.

The use of advanced SMD (Surface Mounted Devices) technology on thickfilms with 1% precision resistors minimize the use of controls and enhances circuit reliability and performance.

A unique transformerless isolation circuit design reduces power, weight, size and interference allowing a compact cabinet design. Circuits provide for 16KHz, 24KHz or 31KHz operation with in-between scans available.



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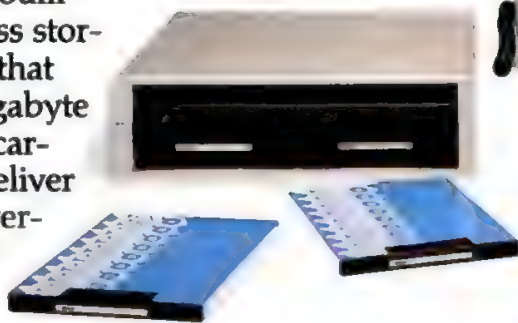
## The Bernoulli Box:™ The Superior Storage Solution.

For owners and users of IBM PCs, XTs, and TI Professionals, where to put and secure the substantial amounts of data they are processing can get to be quite a problem.

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## PRODUCT REVIEW

## OZ: Real World Management Control

### OZ: Management Control

Fox & Geller, Inc.

604 Market St.

Elmwood Park, NJ 07407

(201) 794-8883

List Price: \$495

Requires: DOS 2.0, IBM PC with two double-sided disk drives or XT with one double-sided disk drive, 256K RAM.

Fox & Geller, Inc. now has its own application package, *OZ: Management Control*, to help managers analyze financial information, and provide extensive report, consolidation, and graphic features.

The company is known for its popular utility programs *QUICK-CODE*, *dGRAPH*, *QUICK-SCREEN*, and *dUTIL*, all of which work with Ashton-Tate's *dBASE II*. Within the past year, Fox & Geller started producing standalone programs, including *Grafox*, a graphing program, and now *OZ*.

*OZ* meets a need that is not covered by the usual spreadsheet products, according to Fox & Geller Chairman, Jacob Geller. This program is set up to handle financial data, such as balance sheets and income statement accounts, so the user does not have to go through the lengthy process of creating a spreadsheet template.

A manager enters figures for the current and past year actuals, and current year budget and projections. Data may be entered as individual values or a progression of values based on a formula (such as the prior month's value plus 10 percent). Once the data is entered, changes may be made, and *OZ* will record up to three lines of notes explaining why the changes were made. A complete audit trail of changes is maintained, so that it is possible to recreate all the transactions that lead to the figures in each account line. There may be as many as 149 account lines in use at a time.

*OZ* contains 12 report templates that the user modifies and redefines to create up to 100 stored report formats. Data can also be reported as a graph, in line, bar, stacked bar, and pie chart formats.

A manager may also keep information for multiple divisions or departments, and consolidate the figures for an overall report. This feature uses a tree-structure to map out the organization, with each unit having up to eight "offspring." There may be up to 50 units in the structure.

### Distributed Processing

Consolidation is made easier by the fact that the data files for the different organization units are kept in separate files. This means that *OZ* may be run on separate computers at different remote locations, and consolidated reports may then be compiled from disks sent to headquarters. Data may also be imported from DIF files and standard comma-delimited text files.

While Fox & Geller claims that *OZ* creates a new software category, it appears to be similar to other existing decision-support packages. It does not contain the calculation power of some others (such as *VENTURE*, see "Building Financial Models: *VENTURE* and *PLAN 80*" *PC*, Volume 3 Number 8). The graphics capabilities and ease of use do set *OZ* apart, however. Its many features provide so many ways to present financial data that a manager could easily be seduced into "playing" with the data forever.

*OZ* runs under DOS 2.0 or 2.1 on an IBM PC with 256K and at least two floppy disk drives, although it works much better on a hard disk. It supports either a monochrome or a graphics display, and can use both simultaneously to present tables of data and graphs. The program has a retail price of \$495.

—Alfred Poor

## 'Singing in the RAM'

CHICAGO— The musical capabilities built into the IBM PC are more likely to inspire users to exclaim, "Pathetic..." than to attempt to write BASIC code for Tchaikovsky's "Pathetique Symphony."

Although the PC might have a great future controlling external synthesizers BASIC's own *PLAY* and *SOUND* commands can only coax out one note at a time and can't even control the volume. Even a *PCjr* or *Commodore 64* let you play three notes at a time with greater expression.

Because of the PC's musical handicap, we were astonished when we heard a disk with five compositions, programmed by John Brink, that seemed to squeeze several voices out of the monophonic PC. He massaged the PC to play both melody and accompaniment parts in his faithful renditions of Chopin's "Minute Waltz" and Leoncena's "Malaguena." His version of Debussy's "Clair de Lune" had such a sensitive rubato that we suspected Brink must have re-specified the tempo for nearly every note.

Brink, the president of Blackhawk Data Corporation, revealed a few of his secrets. You can fool a listener into hearing notes simultaneously if you program the lower notes to sound just before the higher melody notes, which are synchronized with the actual metric pulse. When the PC runs a Compiled BASIC version of programmed music, the computer responds fast enough for the high and low notes to sound almost at the same time.

Brink planned to sell a disk that PC users could treat like a

record album; they could boot it up, then sit back and listen to his virtuoso repertoire of Compiled BASIC statements. Brink was discouraged, however, by friends who pointed out that no one had succeeded in selling software that merely played music, even though computer and phonograph disks are physically similar. Users appear willing to buy music software only when it lets them share the fun of composing.

To meet that market, Brink is preparing a "music editor"—the musical equivalent of a software text editor. It will include such capabilities as "play screen," which can be used like a Print Screen instruction. He'll also provide a guide with programming tips that helped him get advanced musical results out of the IBM PC. The program disks may include some of his musical arrangements, which users can listen to for inspiration. When ready, this package should be available from Blackhawk Data Corporation, 307 North Michigan Ave., Chicago, IL 60601, (312) 236-8473.

Although any *PCjr* could get two or three voices with less trouble, *PCjr* users could apply Brink's tricks to make IBM's prodigy sing with six voices.

Until Brink's musical package is ready, you can hear a preview that's now playing on the public-domain software circuit. He loaded his version of Chopin's "Minute Waltz" (renamed *MINWALTZ.EXE*) onto a Chicago-based bulletin board, and this selection is part of the repertoire of other bulletin boards and user groups. (To register for the Chicago bulletin board, contact Gene Plantz, P.O. Box 95638, Hoffman Estates, IL 60195.)

—James Langdell

## Speaking of Computers: No Comment

"In absolute terms, today's personal computers are not very impressive." Apple's Macintosh, he added, "isn't so bad on a relative basis," but the IBM Personal Computer, which uses more conventional technology, "is beneath comment."

Alan Kay, upon resigning as chief scientist at Atari Inc. to take a top position at Apple Computer, Inc.  
New York Times, May 3, 1984.



```

breakpoint encountered, CS:IP=MEMORY_TESTER:0000
OP
000 CODE OPERAND(S)
0000 JMP $+0002 MEMORY_TESTER:0000
MEMORY_TESTER:0000
ADD ADD WORD PTR [FSI2],0040 HSIADDR+0002
0002 READ - DS - 00
0003 READ - DS - 10
0004 WRITE - DS - 40
0005 WRITE - DS - 10
LOCAL VARIABLES ON THE STACK
BUFFER = 0001:0000 BUFFERLENGTH = 001F
BUFFER CONTENTS
0001:0000 54 45 53 54 40 45 40 4F 52 59 20 50 4F 49 4E 54 *TESTMEMORY POINT*
0002:0000 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0003:0000 CS=0632 SS=0903 DS=0903 ES=1000
0004:0000 IP=01C2 SP=FS00 SI=FS00 DI=0903
0005:0000 BP=FS00
0006:0000 TL=00 00 11 10 00 00 00 00
assemble BP Byte Compare Console Delete DMA Echo Macro Evaluate Fill Flag
IF Init INT Load LOGic Loop Macro Menu Module Move NEst MORE
Atron's PC Probe Version X103 (C)Copyright Atron Corp. 1983, 1984

```



# ATRON Announces A State of the Art Advance in Software Debugging — PC Probe

## PROGRAMMERS AND MANAGERS

know that finding bugs during new product development and over the entire product life cycle adds up to a significant portion of total product development cost and support time. Investing in the right debugging tools will greatly improve time to market as well as minimize development cost. Atron Corp has the right debugging tools for the PC environment. These are:

- 1) PC PROBE
- 2) SOFTWARE PROBE
- 3) PERFORMANCE ANALYZER

PC PROBE plugs into a PC or compatible. It is a total system debugger with features like.

### Real Time Trace

Program flow is saved in trace memory while running at full speed. PC PROBE can display trace data as high level language line numbers, procedure names etc. — or as 8088 instructions. In addition, DMA cycles, interrupt lines and external logic probes can be traced. Real time trace answers the question "How did I get here?"

### Memory Protection

What good is a debugger that can be wiped out by an undebugged program? PROBE software is write protected and can't be changed.

## Hardware Breakpoints

The PC PROBE has 8 breakpoints and can trap conditions such as instruction execution, read, write, IO, DMA, interrupt, or external logic probes. Breakpoints can also be set on ranges of address or data — symbolically too!

## Enhanced Human Interface

The PC PROBE designers know the importance of EASE OF USE. The PC PROBE interface has a menu window which displays the syntax of each command — so you never have to remember how a command works. It also recalls the previous invocation of each command to save tedious typing — and tedious thinking!

## Symbolic Debugging

Avoid the tedium of sifting through link maps to find out where things are. The PC PROBE uses your C, PASCAL, assembly language program symbols.

## Macro Commands

Why be limited by a fixed set of debugging commands? PC PROBE lets you create your own powerful macro commands with parameter passing, nesting, LOOPING and IF/THEN/ELSE control.

## ANNOUNCING SOFTWARE PROBE

The same great software used on PC PROBE is now available separately as SOFTWARE PROBE —

**ONLY \$295**

Software probe is the only software debugger available which provides a hardware reset and break box for program crash recovery. What good is a software debugger if you can't get control of run away programs?

## PERFORMANCE ANALYZER

How do you find time critical program problems or know where to start performance tuning your software? Get Atron's new Software Performance and Timing Analyzer. Then you can display histograms of how your programs run — by time or by events. You can perform many different timing measurements.

Atron has many happy customers who have made critical product schedules because of PC PROBE. Why waste time on primitive debugging techniques? — Call us today and ask for your 12-page data sheet. Manuals also available for \$25.



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CIRCLE 156 ON READER SERVICE CARD



## PRODUCT REVIEW

# Advanced Report Manager Almost 'The Best Spreadsheet'

**Report Manager,**  
Advanced Version  
Datamension Corporation  
615 Academy Drive  
Northbrook, IL 60062  
(312) 564-5060  
**List Price:** \$495  
**Requires:** 128K, two disk drives

It's always a treat to see a fine product get even better. Version 1.06 of *Report Manager (RM)* was a good enough spreadsheet to be licensed to Martin Marietta Company as part of the IT series (see "Thumbing Through the Spreadsheets," *PC*, Volume 3 Number 7). The newly released Advanced Version is one of the most powerful spreadsheets now on the market and could bring more licences.

*Report Manager's* great strength is its "data cube" concept, which allows users, not only to build spreadsheets in the usual column and row format, but to "stack" them in pages as well. The data cube can then be "split and rotated" to create new reports that display the same data in new and helpful ways (see "Report Manager, Not Just Another Visiclone," *PC*, Volume 2 Number 6). The Advanced Version now adds a host of new features.

Basic spreadsheet functions have been improved in several ways. All "slash" command options are now displayed as full words rather than as single-letter mnemonics, and the Tab key will now move the cursor to the next non-blank cell. It is also easier to enter data in long columns or rows: A three-stroke command will turn on or off a feature that moves the cursor one cell up, down, right, or left every time you enter data. A glance is now all it takes to determine the current cell address, because the row number and column letter of the cursor's location are highlighted on the co-

ordinate grid. Also, since the Advanced Version is copyable, drive access time can be cut to next-to-nothing by running the program off a RAMdisk. Moreover, the Advanced Version uses five function keys instead of Report Manager's miserly one.

## More Iterations

To *Report Manager's* rich collection of functions, the Advanced Version has added two powerful iterative calculations. A new IRR function solves for internal rate of return, even if the cash flows are uneven and some are negative. The ITERATE function calculates the value of an independent variable that will result in identical values for two different dependent variables. Such a function could be used to calculate break-even sales volume, when both costs and revenues (dependent variables) increase with sales volume (independent variable) but at different rates. ITERATE would calculate the sales figure at which revenues were exactly offset by costs—that is, the break-even point.

The Advanced Version has also added a number of condition-detecting functions that can indicate if a cell is blank, has no value, is in an error condition, and whether it is a textual or numeric cell. Another new function indicates the number of characters in a text cell.

But the Advanced Version's most impressive new feature is a powerful sort routine. Data can be sorted by column, row, or page, in ascending or descending numerical or alphabetical order. Sorts may have up to three "keys," which are useful for breaking ties. If, for example, rows of sales data were being sorted in alphabetical order according to the name of the salesman, the second and third keys might be sales terri-

tory and sales volume. Thus, if several salesmen had the same name, their figures would be sorted by territory, a "tie-breaking" key. If there were salesmen with the same name in the same territory, their figures would be sorted by sales volume, a second "tie-breaking" key.

Sort commands can be long and tricky. A two-key sort might be specified thus: C,F=A1, T=J12, A=A6, D=A7. This would indicate a sort by *Column*, of the information contained in the block of cells *From* A1 To J12, with the first key to be an *Ascending* order sort on the value in row 6 and the second key to be a *Descending* order sort on the value in row 7. Whew!

Fortunately, the Advanced Version makes it easy to invoke a sort command. You could store the whole thing as a text entry in any cell on the spreadsheet. When the program prompted you for a sort command, you'd just indicate the address of that cell and the program would read and execute the command.

Other complex commands can be issued by indicating the cell in which they are stored. The Advanced Version of *Report Manager* has a routine that lets you specify the control characters you would like to send to

your printer before printing begins. Thus, if you wanted a report done in boldface italics you could store the necessary control characters in one of the cells. When the Advanced Version prompted you for them you'd respond with a cell address—a neat and easy way to do the job.

Another solid new feature in the Advanced Version is keyword search. The program can now look forwards or backwards for any string you specify. This can be especially handy for debugging ornery spreadsheets. Since the Advanced Version can be made to display formulas instead of values, you can search your whole spreadsheet for any reference to a particular cell or value.

## New Utilities

Datamension has been hard at work in the unglamorous area of utilities as well. The Advanced Version can export and import DIF and ASCII files. It can also read columnar and delimited data from just about any source. All these dealings with "alien" environments can be by entire spreadsheet or by any portion you choose.

Since the Advanced Version lets you use the entire IBM character set for graphics, line drawings, and pretty borders, it also comes with character trans-

(continued)

## PCjr Makes Its Charity Case

NEW YORK—If IBM wants to sell more PCjrs, it could learn something from educational television. WNET, a Manhattan public broadcasting station, held a fund-raising auction, starting the day after IBM cut the prices of its entire Personal Computer line. "By Design" was the theme of this auction, which offered what WNET's panel of taste-makers called "a museum-class array of superbly designed products."

Among the trendy bent-wood furniture, streamlined tea kettles, and high-tech desk lamps in the auction catalog was item #5508—an IBM PCjr. Apparently this much-maligned machine had impressed Channel 13's fashionable friends.

The ComputerLands of Long Island had donated the PCjr—an entry model with some accessories—valued at \$784 before IBM cut its prices. As the end of the auction approached, the PCjr went on the block, and bidding began at a mere \$375. (Earlier, a Kaypro II went off the block at \$100 below its normal price.)

An hour later...triumph! The high bid was \$920, well above the PCjr's list price.

A moral victory for IBM...and a financial windfall for the cause of quality television. To get PCjrs into more homes and offices—at premium prices—IBM might do well to switch its sales strategy to auctioneering.

—James Langdell



## Spreadsheet (continued)

lation tables for half a dozen popular printers. Since few printers can handle the full IBM character set, the printer tables turn unprintable characters into the closest printable equivalents.

The program even explains how you can use DEBUG to customize the printer tables if you want them to do something different, and if a table for your specific printer isn't included, you can use one of several generic printer tables that are also already on the program disk.

The Advanced Version has also beefed up EXEC, the internal *Report Manager* programming language. In addition to the gosubs, loops, counters,

etc. that came with *Report Manager*, the Advanced Version has added a several new statements. The most significant lets you write EXEC programs that branch according to user command. Thus, if you have set up an automatic data-entry routine for naive users, you can include menus that let operators choose which kind of data to enter and which part of the program to go to. With several sets of menus and branching routines, you could set up very flexible and powerful data-entry systems. Also, EXEC routines can now be invoked from within spreadsheets, giving the Advanced Version a kind of macro-creation capability that the old *Report Manager* didn't have.

## Reworked Manual

The manual has been entirely rewritten for the Advanced version, with mixed results. It is refreshingly clear about what the program can and can't do. You get no nasty surprises; the Advanced Version works the way the documentation says it will. But the manual takes the lazy way out by assuming that people who buy the program must somehow already understand spreadsheets.

The Advanced Version also makes little concession to the current craze for hanging databases, word processors, and snazzy graphics onto spreadsheets. Three-key sorts are the closest it comes to manipulating data, and though it pushes

character graphics about as far as they will go, it can't handle such true graphics' tricks as pie charts and line graphs. What keeps these limitations from being too troublesome is the package's import/export utilities. The Advanced Version can talk to databases, word processors, and even graphics generators, so once it has done its magic, it can hand off the data to another specialized program.

The folks at Datamension haven't tried to make *Report Manager*. Advanced Version all things to all people. Instead, they have concentrated on building the best spreadsheet around. And if they haven't actually succeeded, they've come mighty close. —Jared Taylor

# Calendar of Events

DATE	EVENT	COMMENT	LOCATION	CONTACT
July 16-17	Computer Security Workshop	Workshop on security needs and concerns of IBM, compatible users.	Marriott Crystal Gateway Arlington, VA	Computer Security Institute Dept. IP, Boston Post Rd. Northborough, MA 01532 (617) 845-5050
August 2-4	Great Southern Computer Show	Hardware, software, accessories targeted towards business end-users.	Civic Center Charlotte, NC	Great Southern Computer Shows P.O. Box 655 Jacksonville, FL 32201 (904) 356-1044
August 12-17	The Radcliffe Computer Publishing Course	Course on how computers are changing publishing industry.	Radcliffe College Cambridge, MA	Radcliffe Publishing Procedures Course 6 Ash St. Cambridge, MA 01238 (617) 495-8678
August 16-17	Local Area Networks	In-depth look at local area networks.	Ramada Inn-Old Town Washington, DC	Institute for Advanced Technology Control Data Corp. 6003 Executive Blvd. Rockville, MD 20852 (800) 638-6590 (301) 468-8576
September 5-7	National Software Show	Microsoft-specific trade show.	Anaheim Convention Center Anaheim, CA	Raging Bear Productions 21 Tamal Vista, #175 Corte Madera, CA 94925 (800) 732-2300 (415) 924-1194
September 20-23	Userfest/New York	Hardware, software, accessories.	Madison Square Garden New York, NY	Northeast Expositions 822 Boylston St. Chestnut Hill, MA 02167 (617) 739-2000
October 29-November 1	COMDEX/Europe	Hardware, software, accessories.	RAI Congress and Exhibition Centre Amsterdam, The Netherlands	The Interface Group 300 First Ave. Needham, MA 02194 (800) 325-3330 (617) 449-6600



# Even your favorite software can have annoying personal habits. Get ProKey.



If you're like most of us you probably own an IBM PC and a closetful of popular software. Maybe Wordstar, Visicalc, dBase II and a few others. And with each program comes its own peculiar protocol, commands and demands.

Suddenly you've become a personal slave to your personal computer.

Free yourself with ProKey.™

ProKey is unlike any other software because it operates just about any other software. So you can spend your time creatively while ProKey takes care of the tedious operational details. Silently, instantly, without errors.

ProKey can print spreadsheet tables, update databases, reformat reports and plot graphics and still leave you time to train for the triathlon or run out for a danish.

In fact, ProKey can memorize and execute anything you can type.

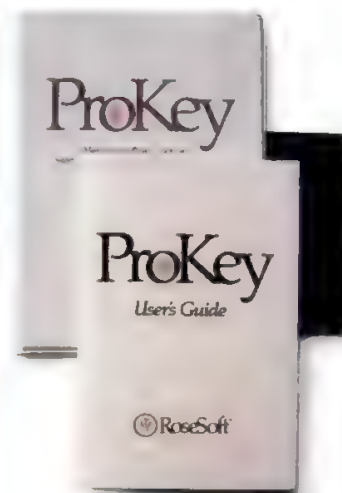
And no matter how extensive your software collection becomes ProKey controls them all, with one easy to remember protocol.

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Once you use ProKey you'll never curse your cursor again.



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(206) 524-2350

**CIRCLE 438 ON READER SERVICE CARD**  
To run ProKey, you'll need an IBM Personal Computer or workalike DOS (any version, including 2.0), and 64K of RAM (WordStar requires 96K).

WordStar, VisiCalc and dBase II are trademarks, respectively, of Micro Pro, VisiCorp and Ashton-Tate.



## PRODUCT REVIEW

## Self-Help Software: Is It OK?

BY MARK MALAMUD

**Coping with Stress**  
**Handling Depressed Feelings**  
**Treating Erection Problems**  
 Psycomp  
 P.O. Box 994  
 Woodland Hills, CA 91367  
 (213) 992-4884  
**List Price:** \$89.95 each  
**Requires:** 64K RAM,  
 one disk drive.

It had to happen. After all, psychological self-help has been a staple of the publishing industry for over 10 years. There's *Don't Say YES When You Want to Say NO: I'm OK, You're OK*; and *Making Friends with the Opposite Sex*, to name but a few. Since everything from cookbooks to emergency automotive repair manuals has been put on disk, it's not surprising that pop psychology has wended its way through digital tracks and sectors.

## Self-Help on Disk

Psycomp is a California-based company formed in 1983 by Robert Reitman, Ph.D., to fill what he saw as a gap in the personal software market: namely, "psychological self-help for the masses of people who might otherwise not have pursued the needed therapy." Reitman is a licensed psychotherapist, a clinical member of the American Association of Marriage and Family Therapies, and a fellow of the Scientific Study of Sex. Psycomp is marketing three programs, all created by Reitman. *Coping with Stress* is available now, while *Handling Depressed Feelings* will be available in mid-July. *Treating Erection Problems* will be released in August.

Reitman says that his software is for those who might be too embarrassed by their problem to seek professional help, or for whom therapy is too costly an alternative. Each of his programs is based upon the theories of cognitive therapy, which contend that an individual's emo-

tions and behavior are essentially determined by how he views the world. In other words, the way a person thinks determines the way he feels and reacts.

The instructions to run all the Psycomp software are easy to understand, and each program makes pleasant use of colorful graphics. Unlike some other self-help programs, however, Psycomp's software neither gathers nor analyzes much information about you. Instead, it leads you through a casual and effective monologue concerning the way thoughts control feelings and actions, and the means one can use to alter these thoughts.

When I finished running through the program sampler that contained introductory excerpts from the three software packages, I had many questions about the usefulness of Psycomp's self-help software. All three programs seem to be very similar in design and have only slight variations of focus for the different topics. My criticisms for all of these programs are best summed up by my overall reaction to *Treating Erection Problems*.

The cover for *Treating Erection Problems (TEP)* shows an attractive man and woman walking down a beach.

On the back of the package it says, "Your purchase and proper use of this program can help you regain your sexual confidence and once again enjoy a fulfilling sex life." There is also a note that the program is designed exclusively for men with psychological impotence problems.

I experienced my first reservations about the program here and wondered if Reitman had taken into account that it is misleading to categorize impotency problems into two groups: physiological and psychological.

The *TEP* sampler gives no hint of the true complexity of the problem at hand, and I wonder if the final version will address

in more detail the need for a thorough vascular, endocrinological, and psychiatric assessment to determine the full extent of an individual's problem. It is known that someone suffering from what might appear to be a psychological problem, in fact, might be experiencing a physiological problem. I can imagine the frustration and depression of someone like this who, without a physical evaluation, is lead to believe that his problem will improve just by "proper use" of Reitman's program.

## Narrow Focus

Further, the *TEP* sampler seems to focus too narrowly on performance anxiety, a fear usually associated directly with performing the sexual act. Many other psychological influences may contribute to an individual's inability to have erections. For example, he may have a partner-related problem (say, a wife who hates sex), may have recently suffered a change in body image (due to an accident-related disfigurement or dermatological disease), or may have had a recent and dramatic change in financial status.

The program does not allow for enough deviation from its programmed path, and often you feel hemmed in by the forced direction Reitman's lecture must take. For example, in *TEP* you are led through a series of initial questions that force you (by offering no alternative choices) to admit that at worst you "rarely" have an erection in the morning when you awake, when you masturbate, or when you see pornographic materials. It is no surprise when *TEP* proudly proclaims you not fully impotent on the next screen. These questions and forced choices give no recourse to someone who truly has not experienced an erection during any of these situations or to someone who for some reason refuses to admit to himself that

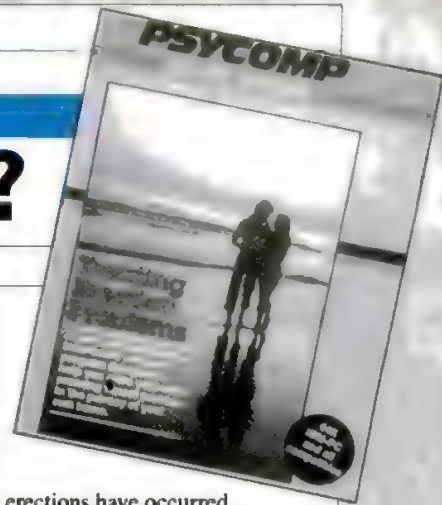
erections have occurred.

Reitman's simple proclamations appear in all the Psycomp programs, but they represent a rather tenuous cure. And in *Coping with Stress* the first request the program makes is that you choose from several inaccurate statements your definition of stress. There is no choice of "Other" here. After you've made your choice, the program goes on to say something like: "Ha! Fooled you. None of those choices was right."

Basically, from the sampler of Psycomp's first three programs, I concluded that self-help software cannot replace professional care and can, in fact, be detrimental to someone who believes his complex problem can be alleviated simply. A straightforward remark on the back of the box that the program is not a substitute for therapy might be in order. And finally, one must question the target audience to which Reitman has aimed his program. Will someone who cannot seek therapeutic help out of embarrassment be any more comfortable purchasing, say, *TEP* in his neighborhood software store? And for the limited range of help that one receives from Psycomp, an informative self-help book seems able to provide a more appropriate range of material and is less costly.

Psycomp's software is a pioneering effort in the field of computer self-help. For this, the programs deserve praise. The time when they will become comprehensive and truly effective, however, has not yet arrived. ■

Mark Malamud has degrees in psychology and computer science.





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# People in the News: James Johnson

Can one person psych out another? All you need is a PC, says Human Edge Software

BY CONNIE WINKLER

PALO ALTO—James H. Johnson is more complicated than most professionals who sit down to use the *The Sales Edge* or *The Negotiation Edge*.

"Isn't he a dynamo?" asks one Johnson acquaintance. Johnson, who heads Human Edge Software, the company that produces the Edge self-help, expert system series, is—to say the least—eclectic.

In a three-piece navy suit and Gucci loafers, Johnson is still the IBM pitchman. But when the Hyperion that runs his demonstration blips, he's also the hacker digging into his disks to get it running again. Johnson is a zealot for his self-help programs, but he's also a teacher setting forth his theories of psychological assessment.

"Do you have a blackboard?" he asks, harkening back to his professor days. The PC offices yielding only a yellow legal pad, Johnson sets about drawing and explaining a 12 by 12 matrix of personality characteristics he's spent 15 years developing. Placed on the matrix axes are contrasting personality types, such as introvert/extrovert, neurotic/stable, and normal/hard-driving.

People can be described in terms of these characteristics, but there's nothing secret or devious about such answers, says Johnson, who has a Ph.D. in psychology and has been the director of clinical psychology programs.

## Simple Quantification

It's simple observation, he explains: If your neighbor brings you a casserole when you're sick, you observe that he or she is a kind person.

Simple enough. But, Johnson's products are all about particular and often difficult human interactions involving a second person—making a sale or negotiating, for example.

The user of an Edge series package (who in more cases

than not bought a PC specifically to run these programs), first steps through a series of up to 100 agree-or-disagree questions, cast in conversational English, that elicit information about the user's attitudes, situation, and goals. The user then answers a similar series of questions about a fellow employee,



customer, or opponent. The program analyzes and compares the two sets of personality information and generates an easy-to-read printout that walks the user through the anticipated scenario in a way that should achieve the optimum resolution.

Human Edge in Palo Alto has a knowledge-engineering team, including a Ph.D. psychologist, a writer, and programmers, who review all the literature on the subject they're investigating—all the advice on how to close a sale, for instance—and cull out the key points.

In the sales example, the key might be: "Make a presentation." Such advice is then bounced against the various personality types in the matrix. Here the expertise really comes to play.

Different personality types react differently to certain situations, Johnson explains. The extrovert sales rep is ineffective before the first cup of coffee; the neurotic/introvert goes zonkers if the sales rep opens with a booming presentation.

"The system gives you a step-

by-step approach how to proceed with sales or negotiations," Johnson says.

## Proposed Scenarios

Here's an excerpted output from a session with *The Negotiations Edge*:

*As a negotiator, Mary Dough is somewhat different from you. You are a confident, serious businessperson who enjoys new ventures and innovative deals. Though she also seeks out excitement, she often takes on too much and responds by becoming worried and agitated. Both of you are sociable people, though she tends to be more dependent on others for regard. You must be careful and direct in dealing with Mary Dough because she is easily upset. Take care to think before you speak.*

What the user gets, says Johnson about the management series, is "Here is how life is, here is how to do the best you can. You don't want the most psychologically healthy person alive for certain jobs. If you had nothing but normals, this would be a dull, go-nowhere world."

## Jello to IBM

Johnson got into computerized psychology in a logical, albeit roundabout way. Shortly after being booted out of Berkeley during the Free Speech Movement days (he was a graduate student in philosophy), he became a father. He made the big jump and went to work selling Jello.

Someone suggested that IBM Corporation was the place to make money and, after all, he'd already abandoned hippiedom. "IBM was nothing planned," Johnson recalls. "I just bopped through and they hired me." He was involved in a \$10 million sale of a 1,000 terminal on-line system for a giant finance company.

Johnson took the IBM money and ran to graduate school in psychology at the University of

Minnesota—he'd always wanted to be a professor. Fortuitously the department was sculpting the classic Minnesota Multiphasic Personality Inventory (MMPI) tests and Johnson had the complementary computer skills.

Grant money rolled in to study whether the computer could evaluate psychiatric patients and lead to better patient care. Johnson wrote lots of papers and gave lots of speeches on this potential. Everybody listened, but apparently nobody believed. Only Johnson.

## Building Company

Johnson started his own company, Psych Systems in Baltimore, for computerized psychological evaluations. Psych Systems went public and he sold his holdings to launch Human Edge, which was incorporated in April 1983 and shipped its first product in December 1983. Sales have progressed well since then.

"We're tracking \$5 million this year," Johnson says. "Obviously we are going to have a public offering. We have tracked better than anybody else but Lotus."

To date, Human Edge's programs have been limited to business management strategies. But, Johnson foresees a how-to series—how to fix your car, for instance—with as many as 300 to 500 programs.

Recent offerings, besides sales and negotiations include *The Management Edge* and *The Communications Edge*. So far, Edge users fit the profile of *PC Magazine* readers: Professionals with a high need to achieve, 70 percent of whom are owners or heads of their companies, and who earn an average \$50,000 to \$70,000.

"In the beginning everybody is so skeptical," adds Johnson. "We have to get people to say, 'Hey, come over here and see this.'"



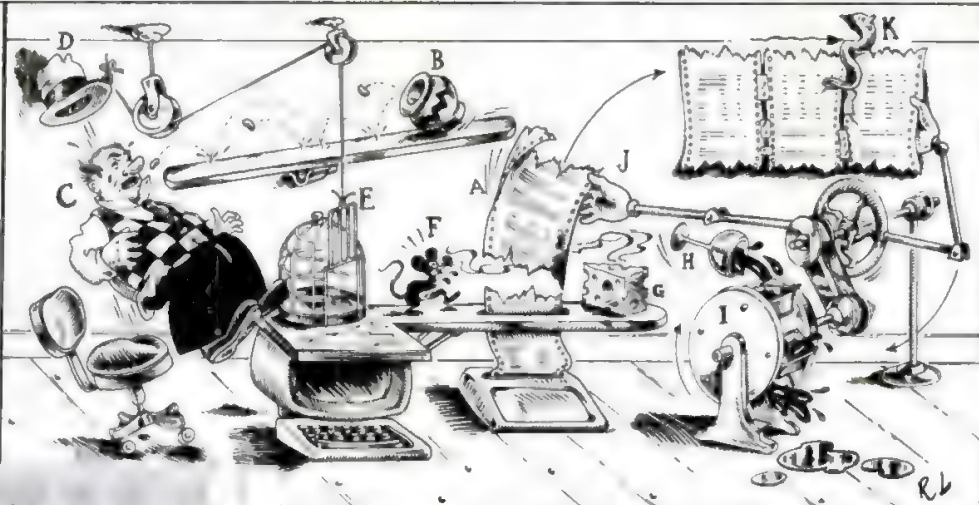
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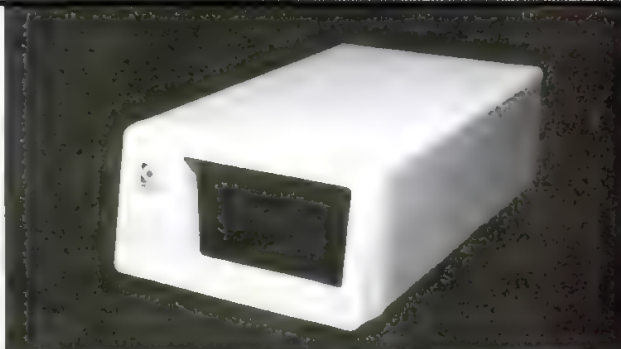
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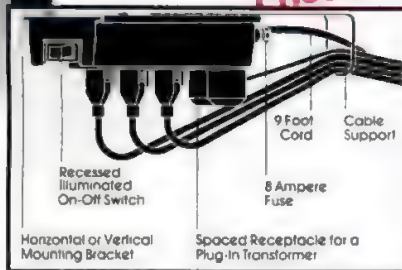
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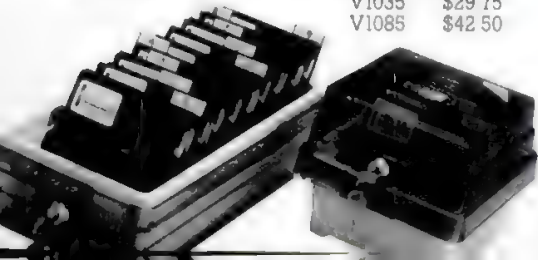
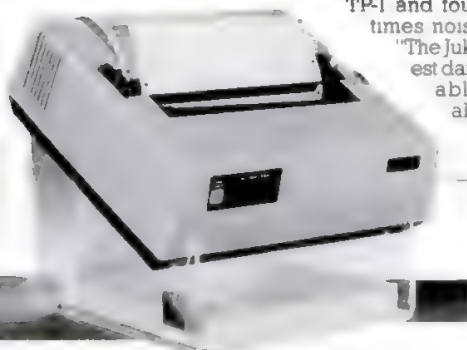
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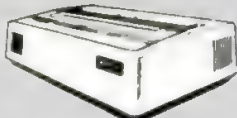
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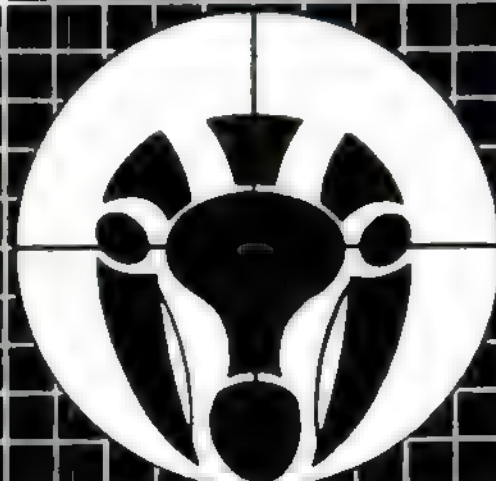
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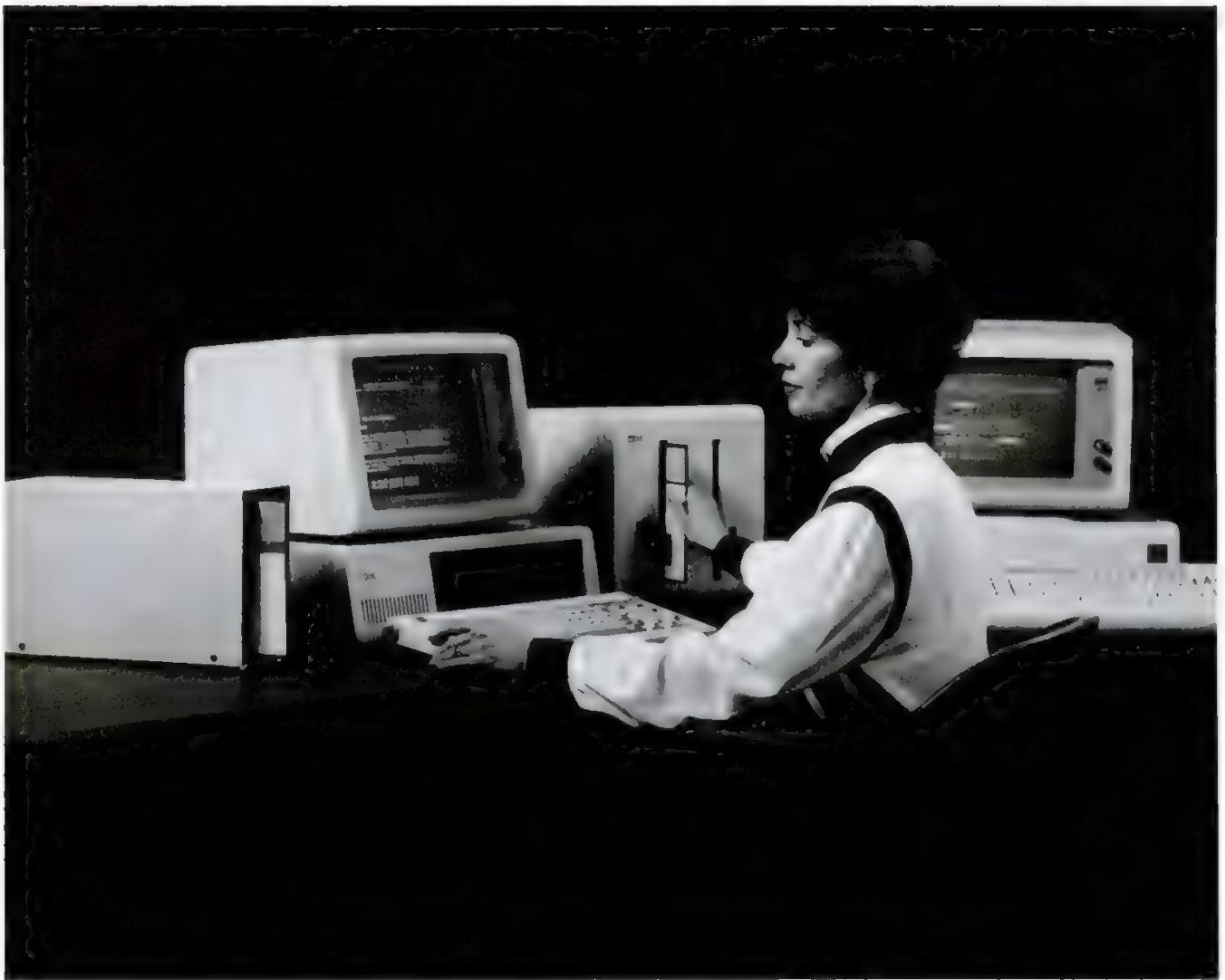
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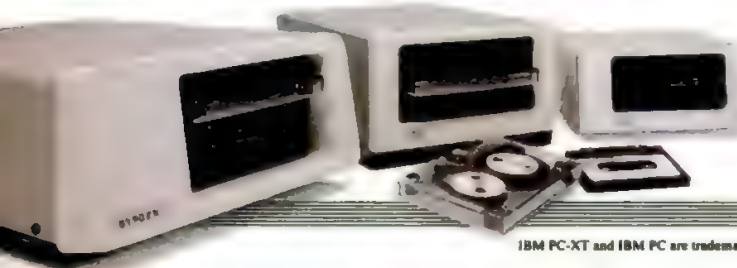
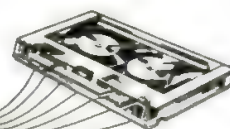
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Along with us, which we ourselves  
produc'd.*

Building a reputation for a new product is a slow and deliberate process. But clouds and shadows surround a product's entry into the market. Some of these shadows take the form of doubts and misinformation emanating from the rumor mill. Others stem from misinterpretation of the facts by media and industry pundits.

*So whilst our infant loves did grow,  
Disguises did, and shadowes, flow,  
From us and our cares; . . .*

How does it start? The first inkling that a product will be introduced comes from the rumor mill. Suppliers are a good source for the future plans of hardware manufac-

turers. Consultants are an erratic, if informative, source for the direction of new software products.

The biggest leaks, however, come from the companies themselves. What



**Bill Machrone**

makes them talk? Pride is a big motivator, as is competition. Sometimes it's a casual comment. Other times, a controlled leak. No matter how the publicity begins, it's the start of a courtship.

The manufacturer courts dealers, distributors, the press, and potential customers. It is courted, in turn, by the pursued, eager as they are for information that will help them plan for purchasing decisions, promotions, coverage, and competition.

For products about which it isn't in the manufacturer's interest to plant leaks,

security and secrecy are phenomenal. IBM's PCjr is a perfect case in point. Almost no one predicted its configuration correctly.

The software publishers have done a credible job of keeping their mouths shut, too. Ashton-Tate managed to keep the wraps on *dBASE III* for 22 months.

*That love hath not attained the highest degree,  
Which is still diligent lest others see.*

Sooner or later, though, comes the fateful product introduction day. The drag racing crowd has an old adage: "When the flag drops, the bullshit stops." While there's a certain poetry in that earthy phrase, Donne said it better:

*But, now the Sunne is just above our head,  
We do those shadowes tread;  
And to brave clearness all things are reduc'd.*

The new product is now exposed for all the world to see. Will it meet with accolades or derision? Warm acceptance or cool disdain? *Brave* is the right word for the manufacturer. You can't be so sure of a product's design, timing, and positioning that you can face an introduction with anything but trepidation. (continued)



# Pick up a SixPakPlus™

Introducing... **SixPakPlus™**, the refreshing new **384KB multifunction card!** In response to the changing needs of the IBM PC and PC-XT marketplace, AST Research, Inc. is proud to announce the latest addition to our line of multifunction enhancement products, the **SixPakPlus!** This new product is the result of extensive marketing research into the needs of IBM PC users whether they have the original 64K system board, the newer 256K system board, or the PC-XT. The

**SixPakPlus** has been engineered to meet these needs at a competitive price while maintaining AST's high standards for quality and reliability.

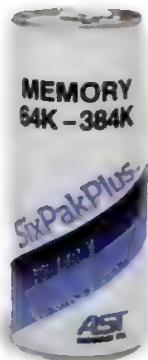
The **SixPak**, as we like to call it, could have been named for the six banks of RAM on it. However, we like to think that it was named for the six functions of the card.





# for your **IBM®** PC.

The features of the **SixPak** include:



**1.** RAM memory starting at 64K, user-expandable in 64K increments to 384K. This makes the **SixPak** ideal for the PC or PC-XT with a 256K system board; 384K on a **SixPak** added to 256K on the system board yields 640K, the maximum addressable user memory in these systems.

**2.** One Serial (async) communications port, configurable as either COM1 or COM2, for use with serial printers, modems, a "mouse," and other serial devices. The serial port has on-board jumpers for easy management of the RS-232C lines, simplifying the wiring of cables in many installations.



**3.** One Parallel (printer) port, configurable as LPT1 or LPT2 (LPT2 or LPT3 when the IBM monochrome card is installed), for use with the IBM/Epson and other compatible printers. The port is compatible with IBM diagnostics.

**4.** A Clock-Calendar with battery backup, featuring an easily replaceable Lithium battery and a quartz-controlled timebase for a high degree of accuracy.



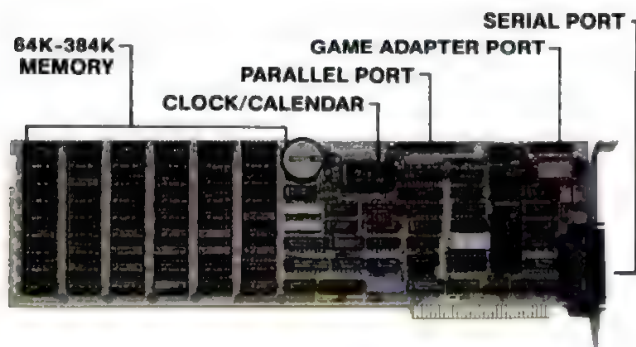
**5.** An optional IBM-compatible Game Adapter port, for use with an IBM-type joystick. In conjunction with application programming, this game port may be used for cursor control, in generating graphics or for playing games at the end of your work day!

**6.** Every **SixPak** comes with an AST SuperPak utility diskette which includes SuperDrive and SuperSpool, the most powerful disk emulator and print spooler software you can get. These programs will greatly enhance the throughput of your PC or PC-XT by emulating disk drive and printer access at RAM speeds rather than the normal slower speed of mechanical devices. SuperPak is the first of such software to be compatible with both DOS 1.1 and DOS 2.0.



Most important of all, the **SixPak** comes with the AST "Plus," AST's unsurpassed reputation for quality, reliability, after-the-sale support, and overall design excellence that gives our products the best price/performance ratio in the industry! Hence the name, **SixPakPlus!**

AST products are available from Computerland, Entre', ComputerMart, and selected dealers worldwide. Call factory if your dealer does not have the AST products you want.



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## EDITOR'S SCREEN

Once a product is that far down the road, there's no turning back. Product introductions involve careful orchestration that takes months of planning, creating

advertising, and choosing markets and media. It's not much different, really, from choosing the right time and place for your first date.

The die is then cast. All that planning and forethought can't create love. It can't make a match. Only the combined acceptance of the professional user base and distribution channels can make a marriage.

Unlike most relationships, however, this one is mostly one-sided. The customer can be rabidly loyal or fiendishly fickle. Most manufacturers have to work constantly to remain the apple of the consumer's eye:

*Except our loves at this noone stay,  
We shall new shadowes make the other way.*

So it goes—users have whirlwind romances with the *VisiCalcs* and *Context MBAs*, but in time discard them for the *SuperCalcs* and *1-2-3s*. These products will one day be supplanted by—who knows?

Sometimes, though, a product is like the girl next door. You grow up with her, have fights, date other girls, fall in love, break up, swear you'll never see her again, then marry her. She may not be the prettiest or the smartest, but she's the one—your *WordStar*, your *dBASE II*, your love. You've got a relationship, a trust; it would take something cataclysmic to destroy that relationship.

Or would it? Could anyone have predicted *VisiCorp's* current predicament? Prevented it?

"I don't know what's wrong with me lately, hon. I guess I'm just on edge, that's all."

Sure. And you're cruising the new-product shelves at the local computer store.

*The morning shadowes weare away,  
But these grow longer all the day,  
But oh, love's day is short, if love decay.*

*Love is a growing, or full constant light;  
And his first minute, after noone, is night.*



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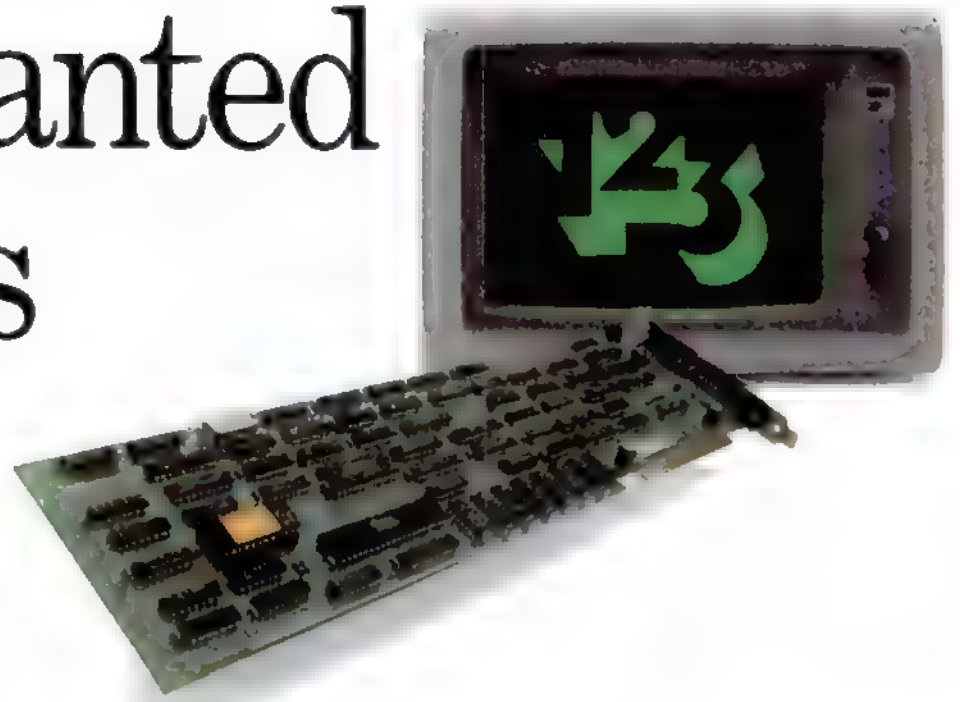
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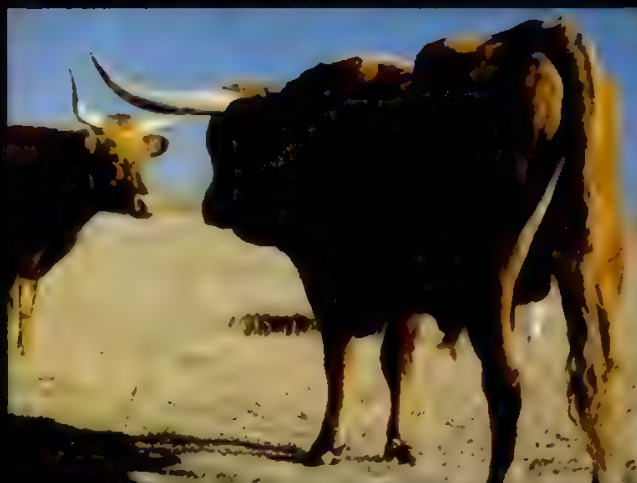
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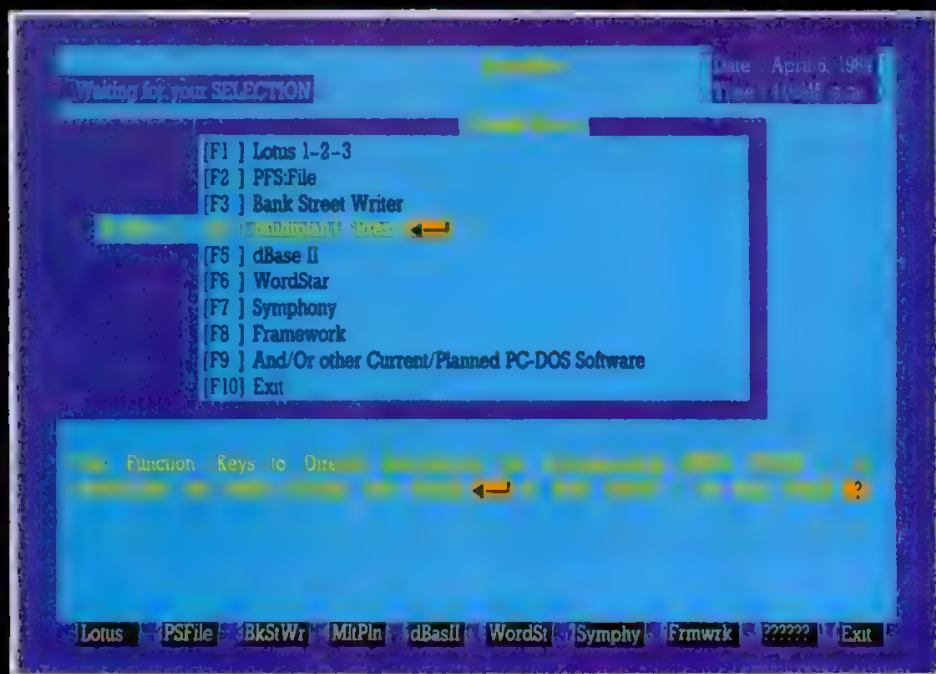
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# A Satisfying Way To Deal with Bugs

Trying to convince a software manufacturer to fix a buggy program is a troublesome process. First you must convince the company's customer support rep that a bug actually exists.

**S**ooner or later you're going to run into a bug. Your new integrated spreadsheet program or powerful word processor just won't work the way the manual says it should. Well, what are you going to do about it? You have three options.

You can live with the bug. For example, if your word processor won't print your text in bold, one solution is simply not to print any bold text. This is the easiest way to deal with bugs, but probably the least satisfying.

You can find a way to work around the bug. For example, your word processor might provide three or four different alternatives for printing text in bold. If the bug affects only one of the alternatives, you can use the others.

Finally, you can get the software company to fix the bug—the most satisfying option. If you call the manufacturer, you will probably talk to a polite, patient customer support representative. As soon as you mention that you may have found a bug, however, the rep may start to doubt your sanity.

Why are reps automatically doubtful about the existence of a bug? Hundreds of calls will come in each day, the vast majority from first-time users of the software who are simply making some kind of operating error. This flood of calls quickly

conditions the reps to be skeptical.

If you want to win the respect and cooperation of the rep, you must be prepared to prove you're not ignorant. You



Steve Sall

must establish your credibility by having your facts and solid proof at hand.

## Avoiding Embarrassment

To avoid embarrassment and high telephone bills, you should be absolutely certain you've found a bug before you call the manufacturer. Before you allow yourself to be convinced, take two important steps.

Be sure you've followed the manufacturer's instructions to the letter. If you're trying to find your way through the soft-

ware intuitively, and you fall on your face, reach for the manual—not the telephone.

Next, try to make the problem recur. This is important for three reasons. First, it allows you to verify that you perceived the problem correctly. Second, repeatability is necessary to isolate the causes of the bug. And third, few reps will try to fix a bug that they cannot witness.

If you're still sure you've found a bug, contact the manufacturer. If you convince the rep that you've come across an honest-to-goodness problem, you'll probably be asked to mail in your disk with instructions for repeating the bug.

It's useful to write a short report providing background information about your computer, add-ons, and additional software running at the same time. Then briefly state the problem and provide specific, numbered instructions for repeating it.

All this seems like a considerable task, but it is definitely worth the effort. By proving the existence of a bug, you help keep software manufacturers on their toes. If we accept sloppy software, manufacturers will be more than happy to keep selling it to us. ■

*Steve Sall is vice-president of technical publications for Multisoft Corporation in Beaverton, Oregon.*



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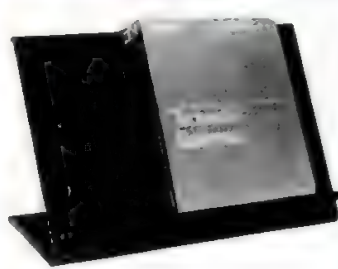
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## ORGANIZE



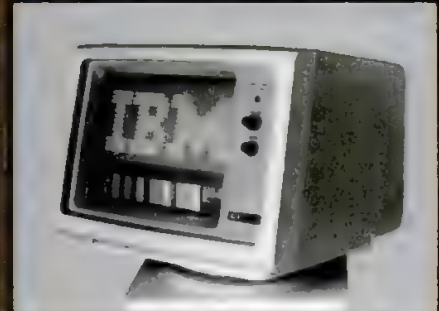
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# Letters to PC

## Degree of Vendor Support

During the past year I have been following your reviews of C compilers and found the articles to be valuable when it came time to choose one for myself. They covered the technical merits of the compilers and it was on the basis of technical merit that I chose the Lattice C compiler.

However, I soon discovered that there is another aspect to choosing software: the degree of vendor support. As an experienced programmer, I felt that I required only a little support . . . I didn't expect little to be none!

Lifeboat Associates, the Lattice C distributor, has not responded to three letters I have written, including the one I enclosed with my registration. In my last letter, I requested details on their update policy so that I could obtain the latest version.

Compared to Lifeboat Associates, MicroPro has been far more responsive. My dealings with MicroPro have always been quick and satisfactory. They even provided me with a free update to Version 3.3 to correct a bug in 3.24.

I'd like to suggest that you devote a section of your software reviews to discussing vendor support. This might include a discussion of update policies, registered user services, responsiveness to user inquiries, and other areas of user support.

Frank Bell  
Birmingham, Michigan

*Rule #1 with our reviewers is "call the manufacturer." For unfathomable reasons, they generally don't treat our people any better than anyone else. Their experiences, coupled with letters from readers like you, usually tell the tale. While there are far too many variables involved for us to assign a rating to the level of customer*

*service a company provides, we will certainly continue to mention any that we find unacceptable.—Ed.*

## Keeping an Eye on IBM

Although I enjoyed your two articles about IBM watchers ("Watching IBM for a Living," "The World According to the



Gartner Group," PC, Volume 3 Number 9) it was a disappointment that they didn't answer some of my questions. How do these analysts make their predictions? How do they work and collect data? How have they developed so many industry sources when regular reporters have not?

When I read their predictions in newspapers and magazines, I often note that they claim to have predicted certain events. How do their predictions differ from good old astrology? Has anyone ever attempted to compare their predictions in print with what actually developed later?

Merryl Polen  
Elmont, New York

*Competition being what it is, it's unlikely that the IBM watchers will divulge their data collection methods or prediction techniques. Some rely on traditional surveying, canvassing, and tabulation. Others extrapolate from the miasma of product announcements, pricing strategies, off-the-cuff conversations, and rumors. And others, I'm sure, rely on astrology. As for their overall effectiveness, you'll*

*have to ask the customers who have paid them all that money.—Ed.*

## Portable Limitations

I purchased an IBM Portable PC and had to return it because of some limitations. IBM states that to be of use, the following must reside in slot 2: 64/256K Memory Expansion Option, IBM PC Cluster Adapter, or Expansion Unit 001 Hard Disk. If you want the hard disk you cannot have more than 256K of memory. The IBM Product Center has refunded my money and I have ordered an IBM PC-XT.

Peter Hanson  
Arlington, Texas

*What you say is true if you stick to IBM expansion boards. The increasing number of short boards that provide memory or (non-IBM) network functions gives you a shot at a hard-disk Portable PC with half a meg of memory and a half-height hard disk. The expansion slots don't know or care what's plugged into them, so the only reason to use the full-length slot is if you can't find the functionality you're looking for in a half-size board.—Ed.*

## Printing Records

George D. Hughes' article "A MicroPro Family Portrait" (PC, Volume 3 Number 8) gives a good overview of MicroPro's family of software, which is the foundation of my software library. In describing MailMerge the author states: "With the conditional commands IF and EXCEPT, you can choose which form letters or address labels to print." However, nowhere in the MailMerge manual (Version 3.3) can I find any mention of conditional commands or any other command for printing only selected records from a data file. I'm beginning to wonder whether there really is such a command for Mail-





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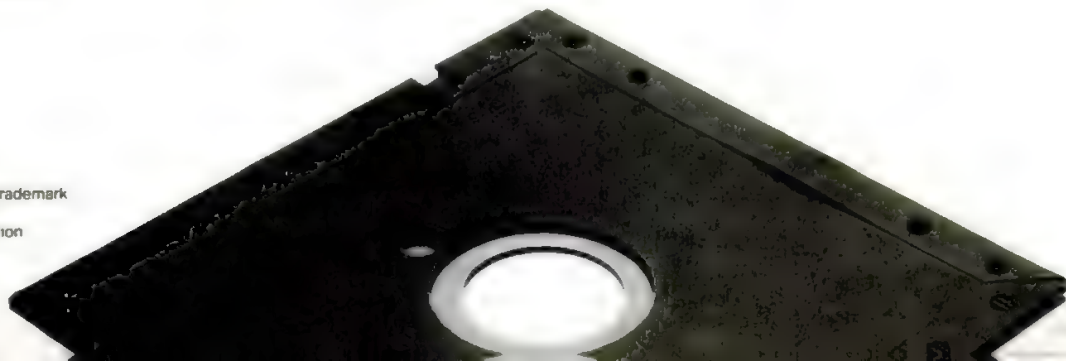
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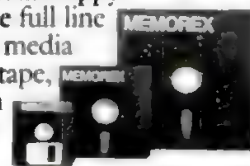
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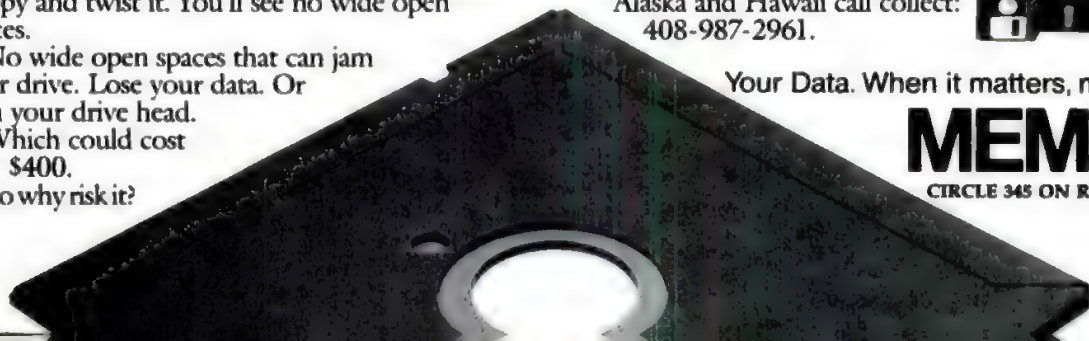
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## LETTERS TO PC

*Merge?* How can I get *MailMerge* to print selected records?

Lynne Bonner Burke  
Washington, DC

George D. Hughes replies:

*Chapter 5 in the MailMerge Reference Manual (Version 3.3), titled "Conditional Printing," gives all the information and commands you are looking for. The .IF, .EX, and .EF commands are the main ones you'll probably need. These conditional IF and EXCEPT commands, when properly placed, allow you to skip over part or all of a document, form letter, or address label. Read pages 5-1 to 5-16 for a more detailed explanation.*

### A Powerful Language

In Volume 3 Number 6 of *PC*, there were several articles comparing the execution and compilation times of Modula-2 to Pascal and other languages. However, the authors failed to compare Modula-2 to what I consider to be a much more powerful language—Turbo Pascal.

Turbo Pascal has many of the same enhancements that Modula-2 has, such as flexible declarations, ELSE added to CASE, HALT, long identifiers, constant restrictions relaxed, and machine-level access. It isn't necessary to go to Modula-2.

I think there is a serious need to explain the strengths of Turbo Pascal.

Richard N. Day  
Birmingham, Michigan

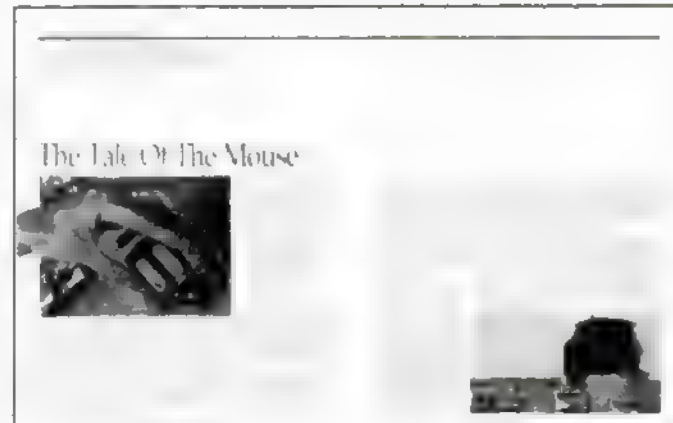
*We agree that Turbo Pascal is a fine product, one that we will review in an upcoming issue. The enhancements you mention are part of the ongoing problem with Pascal. Extending a language beyond its intended scope ruins transportability and drives programmers crazy.—Ed.*

### Trying to Catch a Mouse

I read an article in a recent *PC* that referred me back to "The Tale of The Mouse" by Paul Somerson (*PC*, Volume 1 Number 10). Near the end of that article it was mentioned that the Japanese were going to

be selling mice for as little as \$10 to \$15, but that by the end of 1983 they would have been available for under \$50.

Can you tell me if this came to be, and if so, where can the mice be purchased? I am looking for an inexpensive device to



trace graphics from paper to screen. I can handle the software side; now I need to locate one of these beasts.

Lee Bayley  
Chattaroy, Washington

*Slow acceptance of the mouse has delayed the inevitable price erosion. See "Alternate Input Devices" (PC, Volume 3 Number 12) for some solutions to your problems.—Ed.*

### Clocking the PC

I'd like to make a correction to Stephen P. Smith's article "Metastring Magic" (*PC*, Volume 3 Number 8). I tried to redefine my shift function keys but it would not work. After consulting my BASIC manual, I found that the keyboard codes presented in Figure 2 (page 405) were incorrect. Instead of ranging from 59 to 68, the key codes actually go from 84 to 93.

Furthermore, Smith's clock doesn't work as it should. `$e[60c` is not understood by the machine. After toying with the keyboard for a while, I discovered that continuously typing the following on one line will display the time on the upper right-hand corner without altering the rest of the display:

```
PROMPT $e[s$e[1;69f$t$h$h  
$h$h$h$h$e[u$n$g
```

Of course, the ANSI.SYS instruction has to reside in the CONFIG.SYS when the

system is booted for this prompt instruction to work.

Benjamin Sasso  
San Jose, Costa Rica

Stephen Smith replies:

*The key codes for the shifted function keys should be 84 to 93, not 59 to 68. Several other readers also discovered the error.*

Sasso also complains that the metastring to produce the clock display doesn't work, but in this case he has made an error. He entered `$e[60c` (lowercase c) and found that ANSI.SYS did not respond. What was published, and what he should have entered, was `$e[60C` (uppercase C). Commands to ANSI.SYS must be in the correct case, and it does make a difference which one you use. The alternate metastring that Sasso worked out to get around his problem also produces the clock display.

### Stick to the Rules

After hearing from software writers, publishers, and brokers on the subject of copy protection, I would think that the one sure area of safety would be among one's own: others in the computer-related business community. It seems that this is not so.

Recently, I attended a computer show that is held in St. Louis annually. I saw all the latest software, peripherals, and hardware for micro- and minicomputers. Imagine my surprise when I went by several booths and saw what appeared to be illegal copies of software running or resting beside computers! One hardware manufacturer didn't even attempt to hide the fact that they were running bogus copies. When I discussed this with a representative of one software house, he replied, "Well, we own the original." True, but Corona and Eagle bought IBM PCs too before writing the ROMs they later agreed to change. Owning them didn't give them the right to copy them.

Perhaps next in line should be an over-the-shoulder glance at the same folks who want to have their products protected. Our show was not very big, but I saw at least



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Error Handling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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## LETTERS TO PC

three different booths running bogus copies of Lotus' 1-2-3. How could I tell? All of the programs had hand-written labels on them—that's a dead giveaway.

It seems to me that until the industry's own people learn to keep to the rules, those who use and buy will go ahead and copy at will.

David R. Blair  
Fenton, Missouri

### Update Request

Please consider updating the comparative survey of word processing programs, originally in Volume 1 Number 7. I purchased *EasyWriter*, Version 1.1 but now I'd like a replacement. A lot has happened since your original comparison, and I'd like to read an update.

Ed Clarke  
Ponoka, Alberta, Canada

*You're in luck. We'll be publishing a comprehensive round-up of word processing programs. Look for it to start sometime this fall.—Ed.*

### True Value

Although I frequently find myself wanting to respond to articles published in *PC* and other magazines, I rarely take the trouble to sit down and write a response. My sense of duty was finally aroused when I sat down with your May 15 issue that featured a "Guest Editorial" from Adam Osborne, the erstwhile hardware manufacturer and head cheerleader for the "all-software-is-overpriced" camp.

What I found most objectionable about Osborne's mindless dribble were the two assertions that "The average personal productivity software package costs \$500 and consists of a thin, badly written, badly reproduced sheaf of documentation and a floppy disk . . ." and that "No industry can get away for long with a \$500 price tag on a product that costs \$7 to produce."

The first assertion is simply false. As the owner of several computers and a lot of software, there have been very few packages for which I have paid even close to



\$500. I can only say that for the most part, the experience has been a mixture of nervous anticipation, some exhilaration, some disappointment, but generally an overall good time. Lotus' 1-2-3 comes to mind as a total refutation of Osborne's attack.

More nefarious is his second assertion. Osborne essentially equates the value of software with the material cost of its physical components. Does Osborne really think that a product having a physical cost of \$7 can have no higher value? As an attorney, I have labored long and late over very productive research. I wonder how long I would be able to remain in practice if I charged my clients the \$5 or so that my research memoranda actually "cost" me.

It takes professional programmers a lot of time, a lot of trouble, and a lot of Tylenol to put out the kind of programs that can make it to the shelves, let alone command a \$500 price tag. The idea that the value of one's collective labor cannot morally exceed the cost of the physical media upon which it is finally delivered to the marketplace is one that I am sure all of your readers will find surprising.

Robert Perez  
San Jose, California

### Has Osborne Miscalculated?

Adam Osborne's guest editorial, "An Adolescent in Disguise" presents some "facts" that just aren't true (*PC*, Volume 3 Number 9). First, he asserts that "Lotus has been shipping between 7,000 and 12,000 packages of 1-2-3 per month." According to my calculations, if Lotus bypasses distribution and delivers 1-2-3 to the retail chains directly, then they clear \$250 on each \$495 list price package (we have seen 1-2-3 sold for as little as \$299). Since Lotus just sold \$28,269,000 in the first quarter of 1984, and since Lotus was still a one-product company at that time, then they sold at least 113,000 1-2-3 packages, right? If they went through distribution and got less than \$250 per copy of 1-2-3, their sales would be even higher.

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## LETTERS TO PC

113,000 over 3 months is more than 37,000 a month—where in the world did Osborne come up with 7,000–12,000 a month?

The entire point of Osborne's argument, that Lotus is not selling nearly as many software packages as it should, is exactly wrong. Lotus has, in fact, saturated the market!

Hal W. Hardenbergh  
Santa Ana, California

### Noteworthy Notebook

I'm a new owner of *Notebook* by Pro/Tem and Digital Marketing and I am completely delighted with the program, the manual, and the tutorial. At last, someone obviously experienced in communication and who does not assume that we are all eggheads has written the manual. At last, computer users have a tutorial that instructs, tutors, and is fun to use. At last, after searching for a database management system I found one that didn't cost an arm and a leg. I think *Notebook* is versatile and easy to use.

May their bank accounts be filled with gold! May every database management system searcher be so lucky!

Jack B. Scarcliff  
Akron, Ohio

### Correction:

The telephone number for R & L Software is (617) 964-0992 ("A Plot Fit for a Scientist," PC, Volume 3 Number 9).

### How to Write to PC

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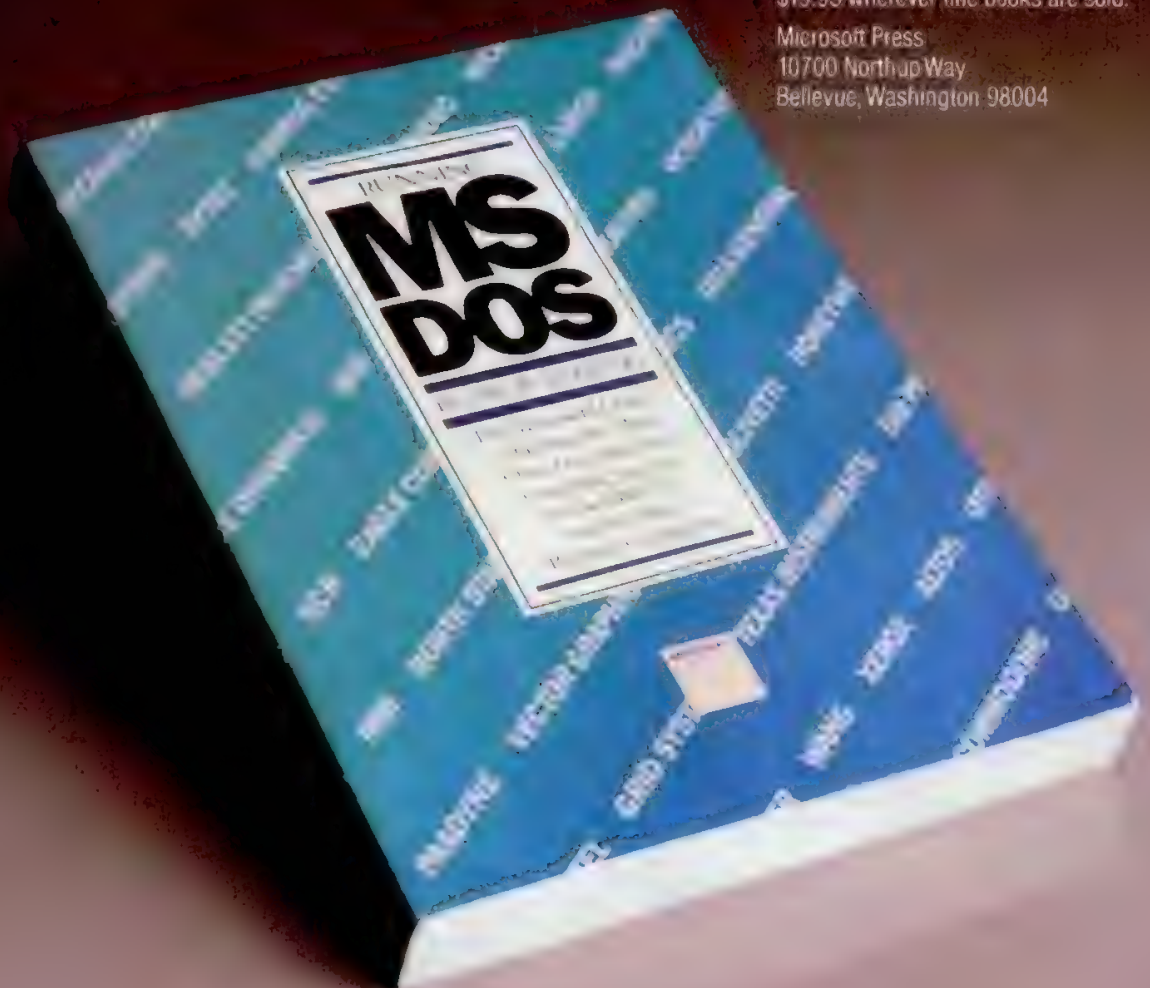
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# A Modest Proposal On Compatibility

Norton stumbles onto a clever solution to the ever-present software compatibility problem but then realizes that his brilliant notion may be nothing more than pie-in-the-sky.

**W**henver I have a great idea, it's an accident. I had one 2 weeks ago, and I can assure you that I stumbled upon it accidentally—so accidentally, in fact, that it took me a couple of weeks to realize how good an idea it was.

Sitting on my desk is the Texas Instruments (TI) Portable Professional Computer. It's luggable and has a high-resolution, full-color, very legible display screen and a 10-megabyte hard disk drive built in. Its computing value is wonderful; its IBM compatibility stinks. Can I use it? No. My workhorse IBM software won't run on it.

In my last column, I discussed the difficulties of producing DOS-generic software—programs that would run on nearly any reasonable MS-DOS computer including IBM's own compatibles like Compaq, and the more exotic machines like the Wang and TI PCs. I argued that the main problems of compatibility involved the methods used to throw display information onto the screen.

## Design Choices

Why should you and I care about these other machines? Isn't the PC dandy enough? It certainly is for me, but it isn't necessarily so for everyone. For example, our PC is relatively slow, compared to what it could be, because of the microprocessor IBM chose for it, the 8088, and the

clock speed IBM chose to drive it, 4.77 MHz. These fundamentals determine its overall computing performance. Many factors go into these sorts of decisions, such as the availability of chips, including



Peter Norton

any hot new ones, at the time the computer is designed. Some recent PC imitators that faced different market conditions and made different decisions can run circles around IBM's PC. For example, the PC-compatible box that forms the heart of both the Sperry PC and the Leading Edge PC has a "turbo" switch that allows it to run at a faster clock time. And the Tandy 2000 uses a much hotter microprocessor, the 80186, a really souped-up version of the PC's 8088.

Besides raw performance, other features people might want in a personal computer just aren't available in our IBM PC—higher-resolution graphics is one, a richer choice of screen colors is another. There is a world of possibilities in personal computing that our PC doesn't offer; no one machine could have it all.

The problem is, we need more than hot machines. We need hot software too. And that's why so many people buy IBM and fully IBM-compatible computers, who might otherwise prefer to have the features that come with a TI Professional, a Tandy, or a Wang. The most important feature of the IBM PC is its dynamite library of programs. If we choose another machine for some spiffy hardware feature, we may have to give up the PC's huge and powerful software library.

If software developers want to write programs that can run on almost any computer, they are faced with some tough problems. BASIC, which most DOS computers run, offers one possible solution for programs that can put up with BASIC's drawbacks (slow speed is the foremost). IBM's version of BASIC has wonderfully powerful features, particularly for screen control. Most DOS computers come these days with a version of BASIC known as GWBASIC that matches most of IBM BASIC's features. Using GWBASIC, our IBM programs can be easily moved from



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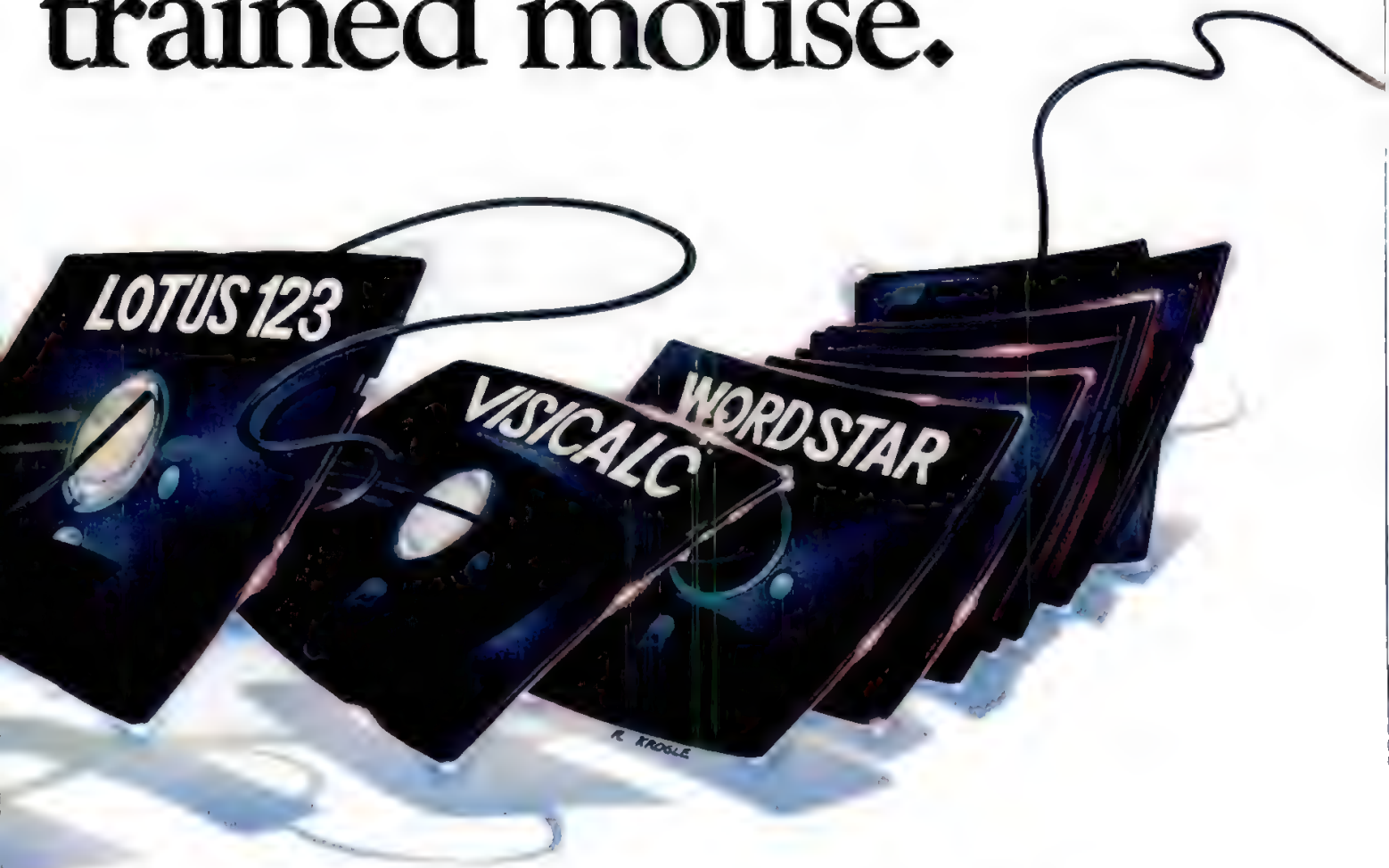
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### Reliable performance

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### Enter numbers twice as fast

Touchstone 1 data entry takes about 40% of the movement required with the standard PC keyboard. Even more important, you don't have to take the time to look for each digit.

An example; the formula:

((43818x12) + (52x147.3))/(47/12))

Using the standard PC keyboard

(forget the PC number pad unless you can cope with the NUMLOCK), this formula takes 37 keystrokes including 6 shifts, and hand movement totalling 137 inches. With the Touchstone 1 keypad, the same formula is entered with 31 strokes, including NO shifts, and total hand movement of just 57 inches.

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one computer to another, but frankly, BASIC doesn't cut it for the most demanding software needs: you'll never see a 1-2-3 or a *Framework* written in BASIC.

Without a hand-holding intermediary like BASIC, programs can't cope with the crucial differences between computers, particularly those related to how information is displayed on the screen. This area is a major obstacle to transportability.

## Microsoft's Solution

The slickest solution to this problem that I have seen is the customized screen driver that Microsoft uses for its programs like *Word* and *Multipan*. Internally, these programs do their own work in a standard way. When it comes to talking to the display screen (or working with any keyboard peculiarities) the Microsoft programs work through a driver, which can be customized to support an impressive array of machines. If you've ever used the Microsoft INSTALL program, which does this job, you've seen what I'm talking about.

If you haven't seen it in action, let me describe it for you. Normally when we get a new program such as *Multipan*, we ignore the program's documentation and instructions, and we just try to run it. With the INSTALL program system, what happens next is that *Multipan* says, "You've got to 'install' me first." So, we try running the INSTALL program. This program describes what it's going to do, it gives us an impressively long list of computers to choose from, we tell it which computer we're using, and then the INSTALL program puts a specific set of subroutines for that computer into the program that we've bought. The whole process takes about 30 seconds, start to finish. When it's done, we try our program again, and it works to perfection on the computer we're using. To experiment, I tried installing *Multipan* on all the machines I had, including PCs, PCjr's (the PCjr takes a different driver, for some reason), Compaqs (although the Compaq is PC compatible, the driver optimizes the machine's perfor-

mance) and TIs. It was quick and easy to install *Multipan* on all of them, and all performed well.

If something like Microsoft's driver were available for every program develop-

A widely available  
INSTALL program  
could make nearly  
any software  
portable.

er to use, then tons and tons of software could be made to run on a wide variety of computers.

A widely available INSTALL program could make nearly any software portable and give us much more freedom to roam outside the green IBM pastures.

## A Software Consortium

In my last column, I said someone should write such a program and make a mint selling it. Or better yet, I casually added, the hardware manufacturers should band together to fund a public effort to create such a program and then give it away free. It took me a couple of weeks to realize that I had stumbled onto a Great Idea.

Consider it. If it were done right, suddenly a wide variety of computers would become, in effect, PC-compatible. They wouldn't have to be hardware-compatible because all those programs could be effortlessly adapted to each computer.

For non-IBM computer makers, this invention would be an incredible boon. They could make their own computer design decisions and still benefit from all that software.

What would it take to make this idea a reality?

Suppose that all the non-IBM manufacturers of PC-like computers got together and funded a venture to write software and documentation that would allow virtually any program to be transported to every

computer on the list. To avoid legal difficulties, I imagine that the venture would have to be completely open—any computer maker could pay the standard dues to join the venture, and all the subscribing computer models would be equally supported. To get wide acceptance among the third-party software houses, the results of this venture—the tools, techniques, and programs needed to make portable software—would be given away free. Why not, after all? The purpose is to ensure that all those computers are supported with software, so that the hardware can be sold on its merits.

The cost of such a venture would be insignificant to a hardware maker. I would guess that it could be done well for roughly \$2 million in start-up costs, and maybe \$500,000 a year in ongoing funding.

Think of it! You choose the software you want, you choose the hardware you want—mix and match. And all the software runs on all the hardware.

Could this ever happen? Probably not. But I wouldn't count out the idea entirely. All it would take is for a few of the big players to call each other up and bat the idea around. Nothing that I write could make it happen. But if the president of Eagle called a group vice-president of Texas Instruments, who had a chat with the chairman of Tandy. . . . Well, that's how the ball gets rolling.

It probably won't happen because the most important players are Big Companies with Big Bureaucracies, and big companies like to keep things in the fold. It's called the NIH factor: Not Invented Here.

Another obstacle to such a portability venture is the time involved. It would take 6 months or a year to get it started, another half-year or more before the results were ready, and still longer before lots of application programs were adapted to take advantage of the scheme.

My guess is, no matter how much it may benefit all those computer manufacturers (and us as well), such a thing will never come about. It's just another page in the script of the human comedy. ■



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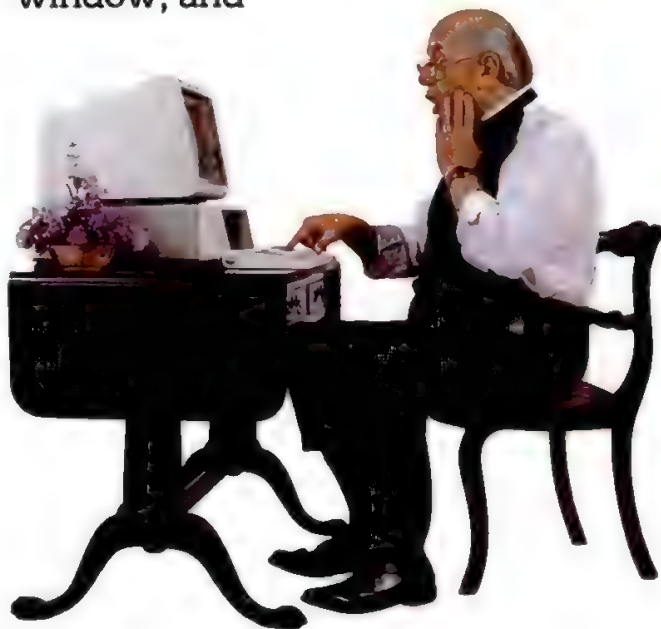


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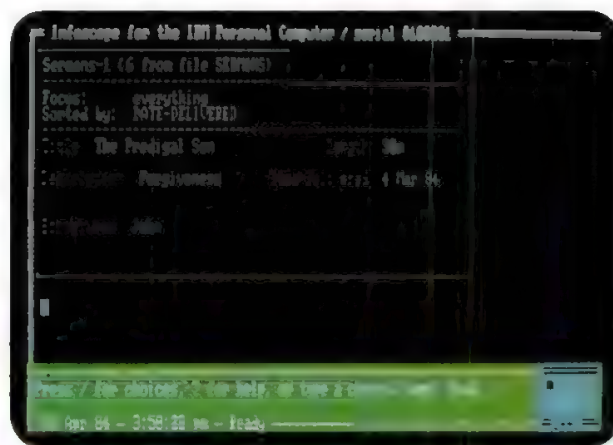


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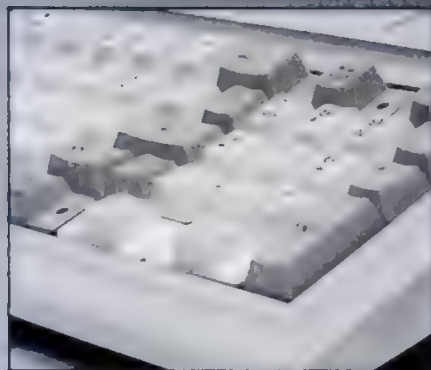
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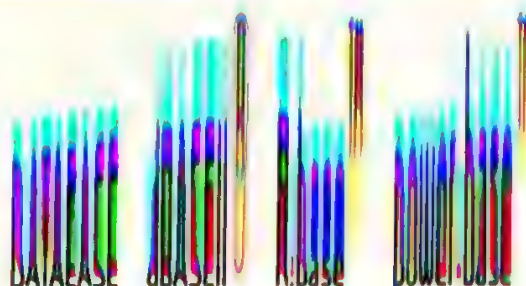
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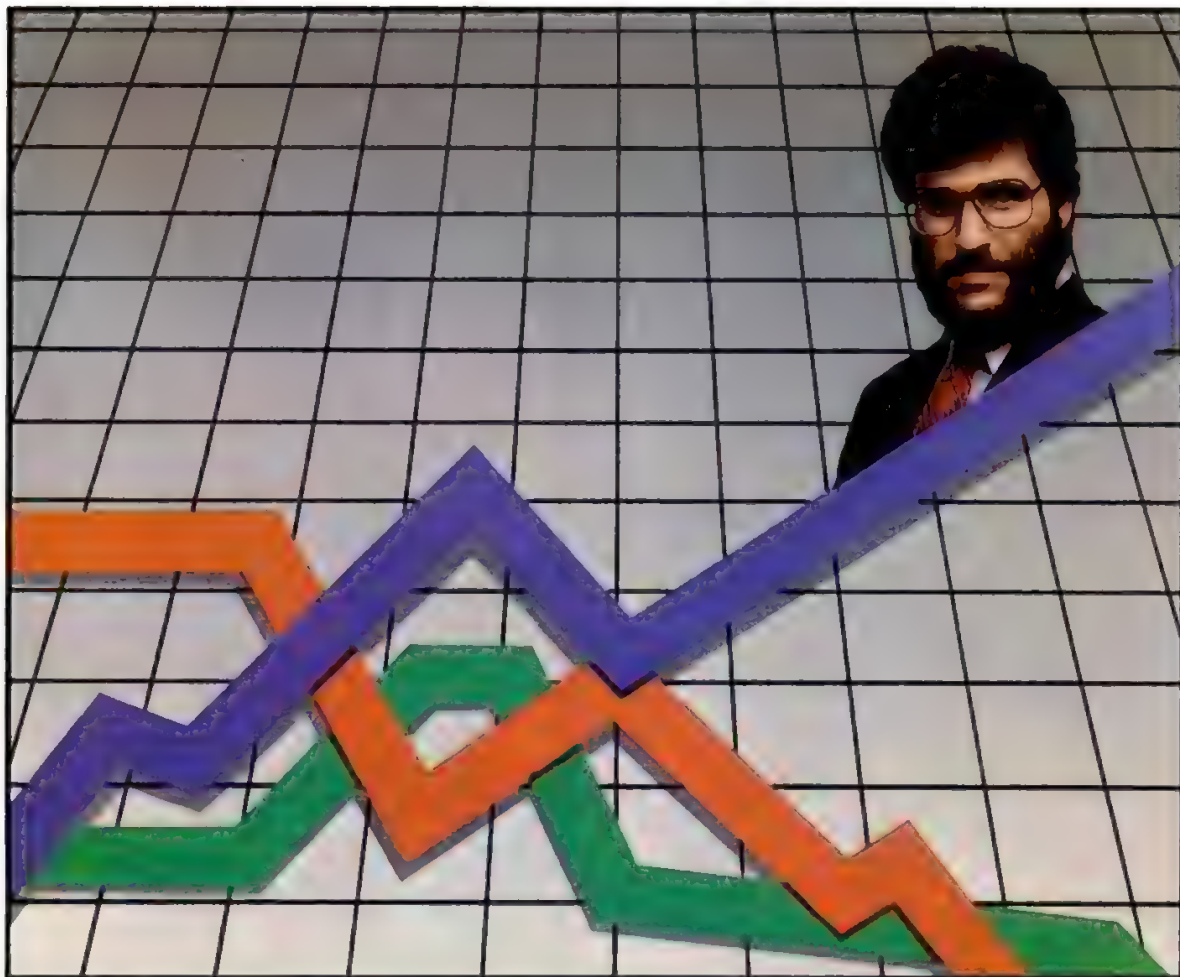
**Nancy Lubecker, Assistant Manager  
Software Centre International**

## DATAEASE Demonstration Diskette

- Check one: ☐ IBM PC ☐ Wang ☐ DEC ☐ TI  
☐ Check attached for \$10. Send complete information package and DATAEASE Demonstration Diskette  
☐ Send information package

Name \_\_\_\_\_  
 Title \_\_\_\_\_  
 Company \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_





## **There's a good reason why Adam B. Green's on top.**

He picks the winners. First dBASE II, then 1-2-3, and now Framework by Ashton-Tate. There is no need to wait any longer to buy the ultimate in software. Framework is here. An order of magnitude advance over integrated programs and windows. A truly three-dimensional design. Infinite logical hierarchies of information. Word processing, outlining, database, spreadsheet, graphics, DOS access and a programming language make Framework the most elegant program yet conceived.

He makes the winners work for you. User guides that set the standards. Seminars to make the programs understandable. Videotapes that bring it home to you. Adam B. Green doesn't just pick the winners, he teaches you how to use them.



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# FRAMEWORK and SYMPHONY Face Off

With *dBASE II* and Lotus' 1-2-3, Ashton-Tate and Lotus Development Corporation have established themselves as the titans of databases and spreadsheets. Now, these software virtuosos are squaring off in the new, expanded arena of full-function integrated software. Will *Framework* build the foundation for Ashton-Tate's software dominance or will *Symphony* drown out its integrated software challenger?



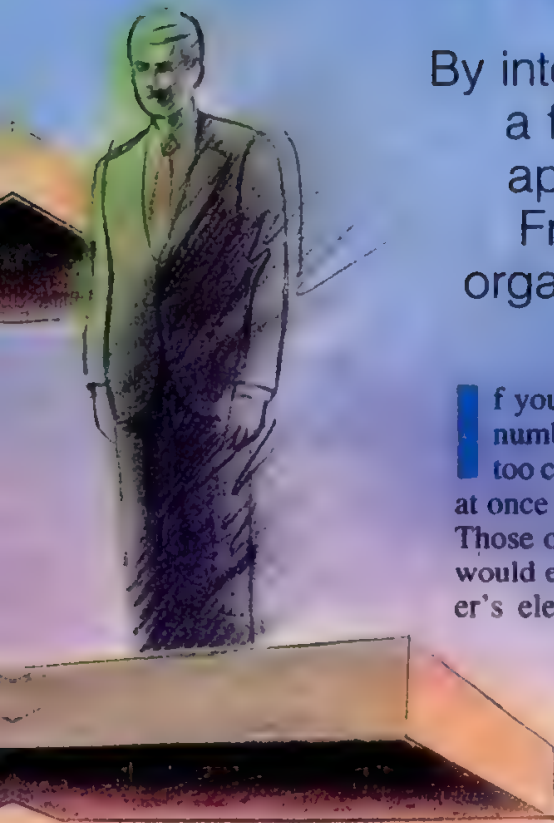




# Framework: An Outline For Thought

By integrating an outlining function into a flexible package of windowed applications, Ashton-Tate's new Framework gives idea workers organizing power that goes beyond spreadsheets.

**I**f you work with ideas that can't always be expressed in numbers, you may have found word processing software too constraining when you're working on several projects at once and you need to constantly reshuffle your thoughts. Those of you who have wondered whether "word people" would ever get their own equivalent of the number cruncher's electronic spreadsheet, take heart. Ashton-Tate may





have some software for you.

*Framework*, a program written in assembly language to maximize its performance on the IBM PC, can best be described as an idea processor. It includes an outlining feature similar to that in *Thinktank*, a well-received software package by Living Videotext, Inc., but *Framework* goes well beyond *Thinktank* with closely integrated additional functions and a window and menu system reminiscent of those in the Xerox Star or Apple Lisa and Macintosh machines. This resemblance is no coincidence. The principal author, Robert M. Carr, is an alumnus of the Xerox PARC laboratories, the seedbed for many recent innovations in software engineering. He also participated in the development of the first major integrated software system for the PC, *Context MBA*. Carr and Martin Mazner, his partner in Forefront Corporation, the developer of *Framework*, have joined forces with Ashton-Tate, the software marketing giant. They hope to reach out to a new generation of software users while retaining the allegiance of the application developers who have done much to promote Ashton-Tate's *dBASE II*.

Although disarmingly simple to use, *Framework* is the kind of program that inspires small armies of interpreters to fully explore its inner reaches. The version I reviewed bore many traces of its earlier existence in the laboratory under the codename Fred and was still a work-in-progress, an emerging gem whose sparkle was occasionally dimmed by a few rough edges. This article, therefore, is more a preview than the full critical appraisal that the final product will eventually deserve.

### Idea Classification

Some philosophers of science have suggested that classification—that instinct to label, pigeonhole, and hierarchically arrange things—is the most fundamental achievement of human thought. Classifi-



“*Framework* is a breakthrough product, like *VisiCalc*, *dBASE II*, and *WordStar*. It sets the pace of the state of the art. Unless you've seen it, you can't describe it; the words just aren't there. All other products are measured against it.”

ADAM GREEN  
noted *dBASE II* teacher

cation is crucial to the work of astronomers, microbiologists, cookbook writers, and librarians who codify and outline specialized knowledge. Even if you have forgotten the outlining techniques you learned in a traditional English class, you probably still try to arrange your shopping lists in rough correspondence to the route you intend to follow through the grocery store. With its outlining facilities, *Framework* tries to build on this instinctive way of arranging ideas.

Unlike Lotus' *Symphony* and some other “second generation” integrated software, *Framework* represents a personal

vision of how people process and create information, rather than the result of careful market research and feedback on an earlier product. It therefore has the advantages (and disadvantages) of a fresh start; it has no need to maintain compatibility with data or command structures from a previous success, as must *Symphony*. Forefront's connection with Ashton-Tate and *Framework*'s need to communicate with *dBASE II* is clearly a rather late development. (No *dBASE II* interface is documented or available in the review version. Writing one was no doubt complicated by the recent release of *dBASE III*, which is not directly compatible with *dBASE II*.)

First impressions of a new software package often can make or break it in the retail market. To my jaundiced eye, accustomed to less-than-stellar velocities from the PC's Intel 8088 chip with a floppy disk and to particularly pokey performance from multifunction software, the first thing that stands out is *Framework*'s speed. Its speed may not bowl you over, but despite its 200-odd K of code, *Framework* loads fast—faster, for example, than Lotus' 1-2-3 with its access system, and, for that matter, faster than any of the current applications on the Apple Macintosh. This speed is a genuine advantage in a program designed to serve as host for a variety of applications. Once loaded into memory, the review version needed no overlay files, which meant that only saving and restoring your data would require access to the disk. Although a future 256K version of the program will apparently sacrifice some speed for greater data capacity by using overlay files, hard-core users are likely to purchase a lot of memory expansion boards to avoid slowing it down.

### Frames on the Desktop

*Framework*'s real pyrotechnics begin after you have reached its “desktop.” Whether you are using a color or monochrome monitor, you will soon see win-



dows—or “frames”—opening and closing at speeds that you might have expected only from a 16/32-bit chip like the Motorola 68000. Yes, *Framework* does do windows, and it does them rather sensibly, too. Any idea, document, project, spreadsheet, simple data file, or graph can become a window. (On a monochrome screen, character graphics similar to those in *Jack2* are used; with a graphics board, italics and other bit-mapped effects become possible.) The really special trick is that each item that can appear in a window can also lie inactive in a “tray” in the lower right-hand corner of the screen or be represented as a line item in an outline.

After booting up the system, you first see a nearly empty screen—or as *Framework* calls it, a “desktop”—with a row of menu choices at the top of the screen. These choices include such common-sense functions as Create, Edit, Locate, Graphs, and Print, as well as a few that require a bit more exploration. To the right of these selections is a digital clock that reports the system time. It can be set automatically if you have a clock/calendar board. In the upper right-hand corner of the desktop area itself, you see symbols for the available disk drives, and at the bottom of the screen, some prompts for the initial functions you will want to use, as well as status indicators for the CapsLock and NumLock keys.

*Framework* tries to make even the newest user feel at home. It prompts you to either create a new document, fetch an existing document from a disk drive, or press the F1 key for further help. Although the help functions were incomplete in the review version of the system, they are intended to be “context sensitive,” providing relevant information about whatever options are currently available. *Framework* also has a special form of help for each special function or cursor movement key; to find out what a key does once you are in the help system, you just press it. Additional help is promised in the form of a tutorial disk.

The way *Framework* uses the PC keyboard deserves special mention. “Myophobes” who can’t bear the thought of sharing their desks with a mouse will be glad to know that Carr and his associates have optimized the use of most PC keys. Users of *1-2-3* will be happy to find that *Framework* uses many keys in familiar ways. One major difference, which at first seems eccentric, is that the Ins key (rather than the slash key as with *VisiCalc*) is used to commence a menu-based command sequence. Because *Framework* is normally in an insert mode (an overwrite mode is

ten standard function keys offer consistent and powerful ways of controlling the size and shape of windows; selecting, moving, and copying data; and switching between outline and window views of items on the desktop.

### Working with Applications

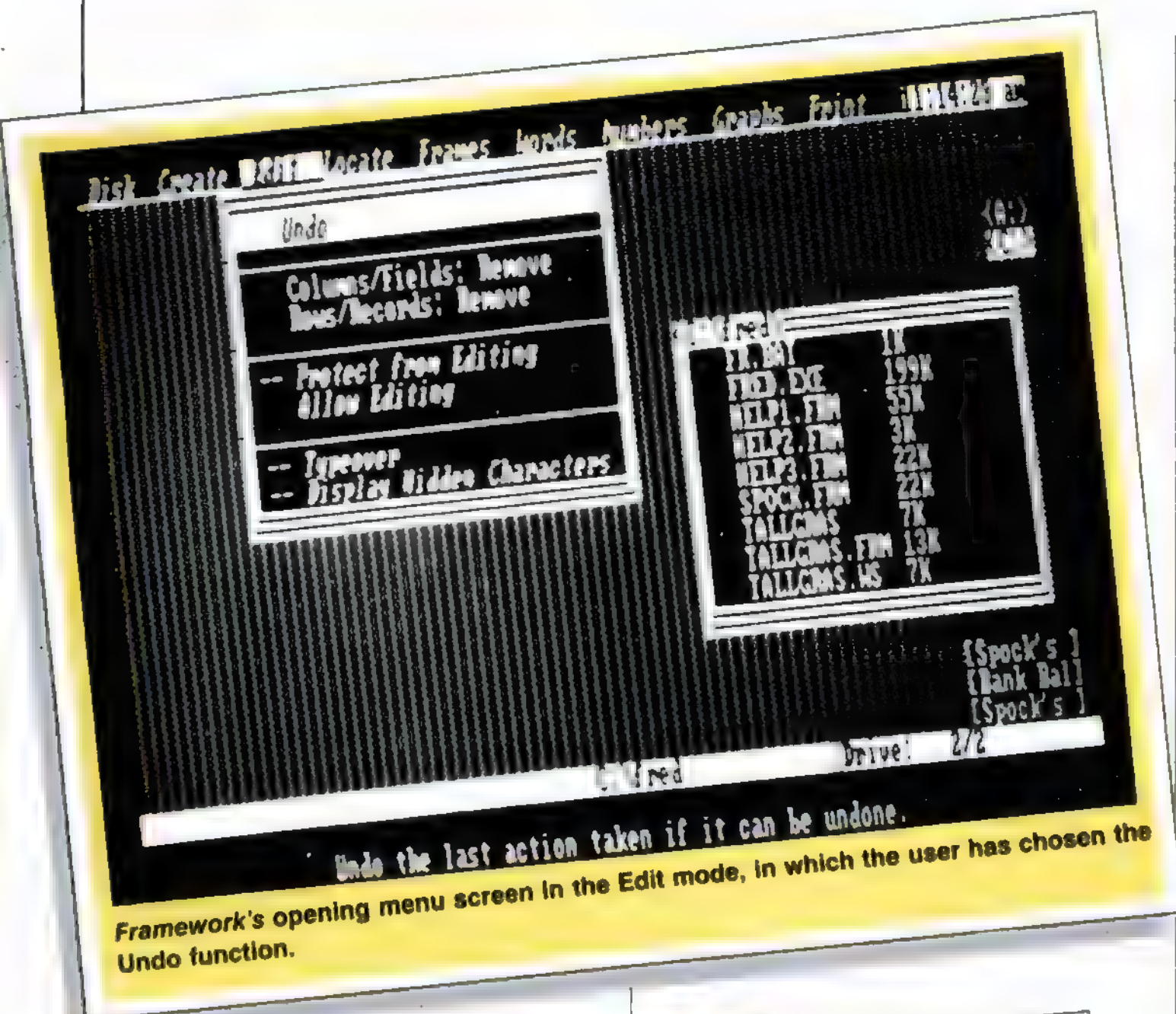
*Framework* initially assumes you may want to work with an existing document. If you do, or if you want to check the contents of a disk drive, you can simply press the Enter key to open the directory of the drive highlighted on the desktop. A



available), the Ins key was free for this use. The key is also quite handy. Pressing Ins will normally take you to the “pull-down” menu and function you were last using. For other menu functions, a two-key control sequence speeds access for experienced users. For example, the Ctrl-E-U key combination takes you to the Edit menu and selects the Undo function. The

partial directory listing quickly appears in a frame on the screen. To work with the material in a frame (including the files on a disk), you press the plus-sign (+) key on the numeric pad. Once inside the directory frame, you can scroll through the alphabetically arranged directory by using the cursor movement keys, including PgUp and PgDn. When a file you wish to work





with is highlighted, pressing the Enter key will immediately bring it into a new frame on the desktop.

Creating a new outline, text frame, spreadsheet or data file is almost as easy using the Create menu, which you "pull down" from the top of the screen by pressing the Ins key. Selecting the Outline function opens a frame containing three major section headings, each with three sub-headings. All are ready to receive labels and potentially can be treated as separate frames. With a bit of practice, you can add new sections, delete unnecessary ones, and resequence any sections you like. You do not necessarily need to use the Outline function initially, however, since you can later establish "containing frames" in which you can reorder or bring together several independently created documents or frames.

The cursor movement keys, the Ctrl key, the function keys, and the Edit,

Framework is Ashton-Tate's answer to the question, "If you and your PC were stranded on a desert island, what one software package would you want to have with you?" Framework has, to date, come closer than any other package to being all things to all people.

**BILL MACHRONE**  
editor, PC Magazine

Locate, and Words menus greatly help you in working with text, whether it is in a standard text frame or in spreadsheets and other applications. Most basic functions of any good word processing program are easily accessible, although some fancy formatting, such as subscripts and superscripts, may not be. With a graphics board, on-screen boldfacing, underscores, and italics appear with selected text at impressive speed. *WordStar* users in particular should appreciate that paragraph reformatting is completely automatic, and simple justification and centering are available for each paragraph or for entire documents. However, text editing isn't much use if data can't be brought in and printed out. It was indeed possible for me to read in a standard ASCII-formatted document and, with a little effort, to totally reformat and print it on an Epson FX-80 printer with boldface, underscoring, and even bold, underscored italics.

Although *Framework* seems particularly well suited to wordsmiths, it's no slouch when it comes to working with numbers. All the major functions familiar to users of other advanced spreadsheets are there, including date arithmetic, horizontal and vertical table lookup, and internal rate of return. The preliminary documentation includes useful examples for many functions, such as a very clear explanation of how standard deviation measures might be useful in a business application.

If you are a heavy spreadsheet user, you may be irritated by the fact that you must allocate the number of rows and columns of *Framework's* spreadsheet (and data file) frames before you begin. This preallocation is probably useful when you plan to merge numbers with text, and it helps to conserve memory, but it does create extra difficulty in setting up a sheet. *Framework's* row and column nomenclature is essentially like the classic *VisiCalc* and *1-2-3* reference form, and the mildly irritating shifted "at" sign (@) is also used to introduce functions. The Enter and Tab keys permit quick movement to an



## F R A M E W O R K

adjoining cell after you have entered data. Ranges can be named, but apparently they must always be based on row or column headings, a system not as flexible as designating any rectangular area. You indicate ranges of cells by a colon separator, as in *Multiplan*. While this method can be a bit annoying, since a colon is also a shifted character, you can enter ranges within formulas by the cursor pointing method. A particularly useful facet of the *Framework* cell reference system is that each coordinate also includes the frame's name. This system makes it possible to refer directly to cells in other spreadsheets and thereby link them. You can sort rows without entering the Database mode—one of several potentially hazardous actions that can be reversed by the Edit menu's UNDO command.

Although graphics functions were not well documented in the *Framework*

review version, they have the potential to be quite flexible. They can be both programmed as functions and produced with little effort through use of the Graphics menu. You can derive legends and titles almost automatically from an underlying range you select within a spreadsheet. Although some types of graphs did not yet appear to be functional in the review version, those that were I found easy to create and modify. Ashton-Tate also has promised facilities to automatically redraw graphs when the associated data are changed. All graphics screens can be printed through the use of the DOS 2.x GRAPHICS utility or the public-domain Grafrax program with an Epson printer. The Print menu suggests that *Framework* ultimately will support several plotters.

*Framework*'s Database function is definitely not a *dBASE II* killer. (Ashton-Tate is not about to sacrifice most of its current

I'm extremely impressed by *Framework* and *Symphony*. Both products are pointing in the right direction, but *Framework* will be a superior product and a greater success. *Symphony* is based on slinging numbers around; *Framework* is oriented to words and ideas. Most people work with ideas.

**PETER NORTON**  
noted IBM PC author  
and software developer

	Mars	Saturn	Xanadu	Brooklyn
Bank Balance	2000	1360	700	390
Travel Expenses	640	500	390	530
New Balance	1360	860	310	-140

A *Framework* spreadsheet showing Mr. Spock's travel expense projections.

revenue.) Although fundamentally very spreadsheet-like—you normally see it with rows representing fields and column headings as field names—a *Framework* database can also be presented as forms in which each record occupies a separate screen. It will temporarily filter records by standard Boolean selection criteria, or you can make the filtering semipermanent by storing the criteria on the border of a database frame. The preliminary documentation warns you of dire consequences if you exceed available memory by combining files, so clearly you should maintain only rather small files. No indexing of files is available, but single-field, in-memory sorts can be done in this mode, as with spreadsheets. Unless the final version of *Framework* has some report and form-letter generation facilities that don't currently meet the eye, transferring data to *dBASE II* will be essential for most "real world" data management tasks.



## All Things to All People?

Even a brief overview of *Framework* would be incomplete without mentioning its macros and programming facilities. Like 1-2-3, *Framework* allows you to program the Alt-letter key combinations with either text or command functions. Altogether, about 140 functions are available in the spreadsheet and in other modes. In addition to very complete date and time functions, *Framework* offers ways to perform international currency formatting and several other unusual operations. Some gaps, at least in the review version, will also be evident to *dBASE II* users. For instance, *Framework* cannot automatically convert keystrokes to upper case, so a programmer developing an application must make it test separately for upper- and lower-case responses to user prompts. On



*Framework* represents the first time a software leader has taken deliberate aim at another software leader's territory. If anybody can pull off this coup, it's Ashton-Tate. But it's possible that the end result of the *Framework*/Symphony face-off won't be conquest, but an expansion of the market to include both companies. *Framework* may draw an entirely new population of word-oriented computer users into the integrated software fold, without wiping out Lotus' hold on dedicated spreadsheeters.



**MIKE EDELHART**  
executive editor,  
*PC Magazine*



The companies' marketing strategies and distribution channels for the two products are quite different because the products are aimed at different audiences. Symphony is number-oriented while *Framework* is more oriented to word processing. But there is a gray area in the middle where they'll be fighting.



**ESTHER DYSON**  
editor, *RELEASE 1.0*

the other hand, *Framework* has handy facilities for presenting prompts to users at the bottom of a screen, timing how long someone takes to press a key, checking which key it is, or even redefining keys. Keystrokes can also be captured to create new macros so that simple programming can be opened up to nonprogrammers. A whole world of programmer's delights, many still undocumented, remains to be explored in *Framework*.

When *Framework*'s built-in capabilities are not enough to meet your needs, you can create a DOS Access text window. In this window, any program or DOS command that could normally be reached from the operating system drive prompt can theoretically be run. I found it quite easy, for instance, to use the CHKDSK utility to check the available disk and memory space, although it would be better still if these vital indicators were made an integral part of *Framework*. (Although even in my review version, the program's error handling was quite good, I was forced to reset the computer a couple of times when the program froze up, at least once from an "out of memory"

error.) Running other major programs from within *Framework* will clearly be possible, although I encountered a few quirks when I tried working with *dBASE II*, 1-2-3, and *WordStar* through a DOS Access window. In each case, however, *Framework* came back, apparently unscathed from these encounters with the competition, when at the DOS level I typed the magic signal EXIT. The DOS Access window is important because it compensates for *Framework*'s lack of any data communication functions.

Despite the package's many wonders, Ashton-Tate and its competitors still must confront the question of who will buy and use *Framework*. Technically minded computer buffs will be attracted to it as a tour de force in software engineering for the current IBM PC architecture and perhaps as a "software lathe" for vertical market applications development. Old hands at producing add-on products for *dBASE II*, such as Fox and Geller, have already announced that they will support *Framework* in similar fashion. But the current primary 1-2-3 spreadsheet and *dBASE II* file management markets may



be more difficult to convince. Perhaps professionals rather than managerial personnel will be the largest single market, although many organizations and individuals will at least want to experiment with *Framework's* special offerings.

*Framework's* approach to accomplishing intellectual work may not really correspond to the way most people normally operate—but it may well come close to the way composition teachers taught them. *Framework* isn't likely to replace all dedicated word processing programs for secretaries, text editors for programmers, or spreadsheets for financial experts, but if I had to choose a single piece of software for professional use, I might well choose *Framework*.

I suspect the ability to run *Framework* will become a new standard test of PC compatibility. By maximizing the powers of the Intel 8088 chip, *Framework* helps to postpone the PC's day of reckoning with

more powerful processors and will put a significant dent, for a while, in the appeal of machines that use other processors.

*Framework* is unlikely to knock Sym-



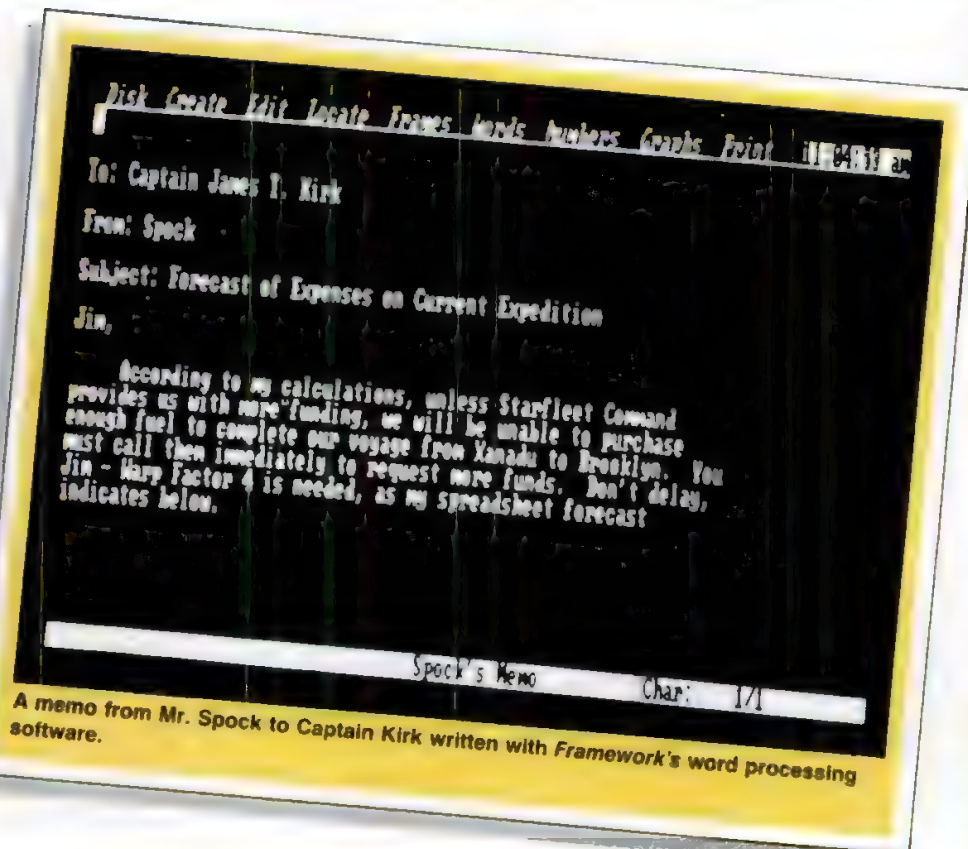
*Framework* is more ambitious and advanced than *Symphony*. It's like the Wankel engine, technologically marvelous but commercially untested. The real battle may well take place among the system integrators, who will find the Fred language extremely powerful and easier to use than Lotus macros.



**SPENCER F. KATT**  
columnist, *PC Week*

*phony* out of the ring, even if it turns out to be technically superior. Lotus has a well-earned preeminence among spreadsheet aficionados, and *Symphony* may be better suited to large organizations with an elaborate division of labor and complex financial reporting requirements. But *Framework* will create serious problems for the producers of other, less-integrated and slower "productivity" application software, and for standalone windowing programs. Only by tying window capabilities closely to the operating system (as Microsoft and IBM are doing), by adding concurrency and multi-user capacity (as Digital Research has done), or by bringing together applications with a common command structure (as *Framework* does) will window programs have much to offer to new users.

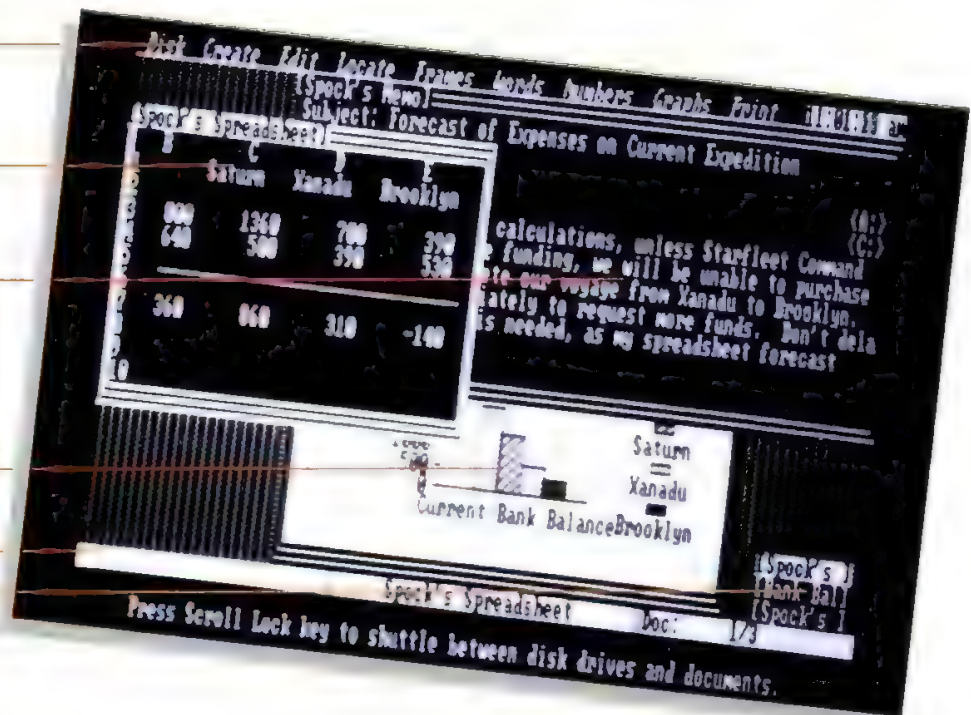
Much of today's software makes a wrenching trade-off between ease of use and power. *Framework*, on the other hand, seems to offer both. The marketplace will ultimately determine whether Robert Carr's idea-processing paradigm is one that large numbers of purchasers will accept, but at least on technical merit and for its genuine innovation, *Framework* deserves strong consideration for the Software-of-the-Year award.





# FRAMEWORK

MODE  
SPREADSHEET  
MEMO  
BAR GRAPH  
COMMAND LINE  
TRAYS



## PO FACTS

**Ashton-Tate**  
10150 W. Jefferson Blvd.  
Culver City, CA 90230  
(213) 204-5570  
**List Price:** \$695  
**Exchange Option:** The company is considering a policy of exchanging *Framework* for 1-2-3.  
**Requires:** Tested version requires 384K RAM; updated version will require 256K.  
**Memory Considerations:** The entire program must be loaded into memory. Database is also held entirely in memory. *Framework* and DOS take up 170K.  
**Maximum Number of Cells:** Up to 32,000, limited only by RAM.  
**Maximum Record Length:** Up to 32,000 bytes, limited by RAM.  
**Maximum Number of Records in Database:** Up to 32,000, limited only by RAM or disk capacity.  
**Maximum File Length:** Up to 32,000 bytes, limited by RAM.

### FUNCTIONS

**Word processing**  
● Does on-screen boldface, underscore, and italics with graphics board.

● Automatic paragraph reformatting  
**Spreadsheet**  
● Each cell coordinate includes the frame's name.  
● Sorting of rows can be done in spreadsheet mode.  
● Size must be preallocated.  
**Database**  
● Analytic tool, not a replacement for *dBASE II* or *III*.  
● Can view database in spreadsheet format or with one record per screen.  
● Up to 32,000 sort fields, limited only by RAM.  
● Filtering criteria can be stored on border of database frame.  
● Size must be preallocated.  
**Graphics**  
● Bar graphs  
● Stacked bar graphs  
● xy graphs  
● Line charts  
● Pie charts  
● Exploded pie charts  
● Does character graphics on monochrome screen, bit-mapped effects with graphics board.  
**Telecommunications**  
● Has full menu-driven asynchronous telecommunications capability.

### ADDITIONAL FUNCTIONS

**System-wide Utilities**  
● You can access all capabilities from any part of the package. A menu comes down from all parts of the package.  
**Language Capabilities**  
● 140 functions available  
● May program Alt-letter keys with text or commands  
**Outline Format**  
● Allows easy rearrangement of frames.  
**Import/Export**  
● Imports standard ASCII; company says that released version will also export standard ASCII.  
● Company says that released version will import/export *dBASE II* and *III* files.

### ASSISTANCE

**Help**  
● Obtain by pressing F1  
● Company says Help will be context sensitive in released version.  
**Tutorial**  
● Company says tutorial disk will be available in released version.

### USER INTERFACE FORMATS

● Menu choices presented at top of screen; can bypass menu levels.  
● Prompts along bottom of screen advise on options.  
● Frames are windows.

### THE SHARED INFORMATION AREA

**Name: Desktop**  
● Initial Function: Get blank desktop with symbols for disk drive. You select and scroll through a disk drive. Files are listed in alphabetical order. You can point to a name on the directory, press Enter, and the file appears on the screen. There is a Create menu for making new files.

### COMBINING FUNCTIONS ON SCREEN

● Frames are concatenated.  
● Graphs are on the screen.

### COMBINING FUNCTIONS IN PRINT

● You can combine all the functions both on the screen and on printouts. You can mix and print text and graphics.



# S Y M P H O N Y



COMMAND LINE

MEMO

PIE CHART

BAR GRAPH

BAR GRAPH

SPREADSHEET

PO

**Lotus Development Corporation**  
161 First St.  
Cambridge, MA 02142  
(617) 492-7171

**List Price:** \$695

**Exchange Option:** \$200 exchange option for licensed 1-2-3 owners.

**Requires:** 320K RAM, two disk drives or one drive and hard disk, monochrome or color monitor.

**Memory Considerations:** Entire worksheet must be in memory.

**Maximum Number of Cells:** 256 columns by 8,192 rows, but less available owing to memory constraints.

**Maximum Record Length:** 256 fields, each containing 240 characters.

**Maximum Number of Records in Database:** Up to 8,191, subject to memory constraints.

**Maximum File Length:** Depends on memory capacity of the computer and size of the file.

**Maximum file length is total memory minus 260K to 270K RAM.**

## FUNCTIONS

### Word processing

- Menu oriented
- Indicates current page and line.
- Highlights text in Copy, Move, or Erase.

### Spreadsheet

- Incorporates 1-2-3 spreadsheet capabilities.
- 70 formula functions perform automatic computations.
- Character string functions to dissect or concatenate strings.

### Database

- Forms oriented
- Up to three sort keys
- Query using special form

### Graphics

- Line charts
- Bar charts
- Stacked bar charts
- Pie charts
- Exploded pie charts
- xy chart
- High-low-close-open stock charts

### Telecommunications

- Requires modem and asynchronous adapter.
- Transmits Symphony worksheets.
- Uses on-line database and mail services.

## ADDITIONAL FUNCTIONS

### Services menu

- Commands common to all environments
- Stores, retrieves, and lists files.
- Prints portions of worksheet.
- Creates windows.

### Command Language

- Incorporates 1-2-3's macro capability to mimic keystrokes.
- Procedural language
- Use to develop own menus.

### Import/Export

- ASCII, dBase II, VisiCalc, and DIF formats.

## ASSISTANCE

### Help

- F1 key
- Context sensitive

### Tutorial

- On disk, 16 lessons, 15 minutes each.
- Introductory level

## THE SHARED INFORMATION AREA

**Name:** Worksheet  
**Initial Screen:** Spreadsheet

## COMBINING FUNCTIONS ON SCREEN

- Can combine data in any function's formats in one document with following limitations:
- Using monochrome display adapter, cannot display graphics;
- Using color adapter, Hercules board, or Compaq, can display text and monochrome graphics simultaneously;
- Using special supported graphics board, can display text and color graphs simultaneously.

## COMBINING FUNCTIONS IN PRINT

- Cannot print text and graphs simultaneously.

## USER INTERFACE FORMATS

- Menus used throughout.
- 20 function key combinations, plastic overlay provided.
- Windows are unlimited in number but may vary in shape, position, and extent of overlay.







# Symphony: A Community Of Information

Lotus has added word processing and telecommunications to 1-2-3's functions and come up with an integrated masterpiece that emphasizes the sharing of data among five applications.

**N**apoleon would have liked *Symphony*, an integrated package with enough capabilities to satisfy anyone with an intense craving for power. Lotus Development Corporation has again ushered in a new generation of integrated software. *Symphony's* power and flexibility, 1-2-3's massive and loyal following, and a multimillion dollar advertising campaign will ensure Lotus a strong position in this year's race for software supremacy. (continued)



*Symphony* touches upon every important microcomputer application. In many ways it rounds out the capabilities of 1-2-3, but it also includes a multitude of new features.

Some of the most powerful and complicated ideas in software design originate from plain common sense. The electronic spreadsheet, for example, was born out of the simple recognition that a microcomputer could handily answer the storage and calculation requirements of accounting analyses. The new generation of integrated packages has also evolved from a simple but powerful idea: Data is data. No matter how you use it—as a spreadsheet, a database, or a graph—it is still merely a collection of characters and numbers that you can manipulate and view.

### The Worksheet

Lotus made this concept the basis of integration. One of the most important features of *Symphony* is that all data is stored in a common area, called a worksheet, that is shared by the five *Symphony* environments: spreadsheet, word processing, database management, graphics, and telecommunication.

Think of the worksheet as a grid of rows and columns. On this grid you may store the letters and numbers that comprise, for example, your 10-year revenue forecast. But because the word processing environment shares this worksheet grid with the spreadsheet environment, your word processed budget report has access to the very same numbers that comprise your revenue forecast. Therefore, you may insert a table in the budget report that reflects a number from the revenue forecast or even embed the entire spreadsheet in the report. Change an assumption in the spreadsheet, and the text of the report will reflect the new spreadsheet results. The common storage area extends this type of integration to all five work environments.

When you load *Symphony* for the first time, the spreadsheet environment com-

mandeers the screen. To issue commands in any of the environments, you select an option from a menu—a concept implemented and popularized by 1-2-3. In each

the worksheet; affect the structure of the display; and determine the amount of available memory and various other settings. By grouping these common com-



“*Symphony* will be like 1-2-3, a standard by which everything else will be measured. It has more features and closely coupled communications capabilities, and its spreadsheet is more powerful. *Symphony* has more functions than *Framework* and greater communications capabilities. *Symphony* can send, with one keystroke, a record or file to or from another location. 1-2-3 is currently the standard product in every profession; replacing it will be difficult. But as their needs increase, first-generation 1-2-3 users will upgrade to *Symphony*.”

**BEN ROSEN**  
financier and former  
chairman, Lotus  
Development Corp.

environment two command menus are available. You can invoke a menu specific to the environment you're currently in with the F10 key. The other menu, which is called the Services menu, appears when you press the F9 key and consists of commands that are common to all environments.

The Services menu allows you to store, retrieve, and list files; print segments of

commands into the Services menu, Lotus endowed *Symphony* with a uniform command structure.

You can move from the spreadsheet to another environment through the Services menu, but this requires a number of command selections. A quicker way is to use the function keys. *Symphony* makes use of all 10 function keys on the PC and doubles them by assigning additional functions to



the Alt-function key combinations. Don't worry about memorizing all 20 functions; like 1-2-3, *Symphony* comes with a plastic overlay that identifies the dual functions of each key.

Alt-F10 brings up a menu of environment choices:

#### Sheet DOC Graph For Comm

Like most commands in *Symphony* as well as those in 1-2-3, these can be selected in one of two ways. You can highlight your selection with the cursor and then press the Enter key, or simply type in the first letter of your choice. Choosing DOC (short for document) transforms *Symphony* into a word processor. Figure 1 shows the word processing environment. A window frame occupies most of the display, enveloping the text. The top of this window is a format line that determines tab settings and margins. You press the F10 key to bring the word processing menu to the screen above the format line. A menu pointer highlights the COPY command in the figure, indicating that you can choose that option by pressing the Enter key. The top line of the display describes the highlighted option.

You only make use of the command menu when you want to manipulate the text. Otherwise, you simply type. As you type past the right margin, *Symphony* wraps your text around to the next line. You need only to press Return after paragraphs. The Ins key toggles to control whether what you type is inserted into the text or whether it overwrites existing characters.

A menu-oriented word processor is far more pleasant to use than one that requires learning special command codes. Commands are in English, and if you don't recognize the function of a command by its name, just place the menu pointer over the command and read the descriptive line that appears on top of the display.

*Symphony* also includes a Help disk with over 100 on-line help screens. The



Figure 1: *Symphony's* word processing environment.

Help key (F1) replaces the DOC window with a page of explanation. *Symphony's* Help key is "context sensitive": If you press Help after invoking the word processing menu, you get an explanation and description of that menu. Pointing a cursor to one of the commands listed on this Help screen elicits a more detailed explanation of the command. You might be able to learn *Symphony* by experimenting and invoking Help, although this would not be the most efficient technique.

#### The Word Processor

The word processor handles most if not all of the operations you would expect to find in a dedicated word processing package. You can copy, move, and erase blocks of text; search and replace all or some occurrences of text; left or right justify or center text; create multiple format lines that assign unique

tab, margin, and justification settings to different sections of text; print the text single, double, or triple spaced; and underline or boldface text. The menu does not contain an option to print the document. Because printing is a procedure that you would perform in any of the five environments, it is an option on the Services menu.

If you select COPY, MOVE, or ERASE, *Symphony* asks you to indicate what text you want to affect with the command by expanding a reverse-video cursor over the text. *Symphony* highlights the text so that you know exactly what you are copying, moving, or erasing. Actually, these three commands appear in the spreadsheet command menu as well, to let you copy, move, or erase cells. The commands perform the same functions in the spreadsheet context—another example of uniform command structure.



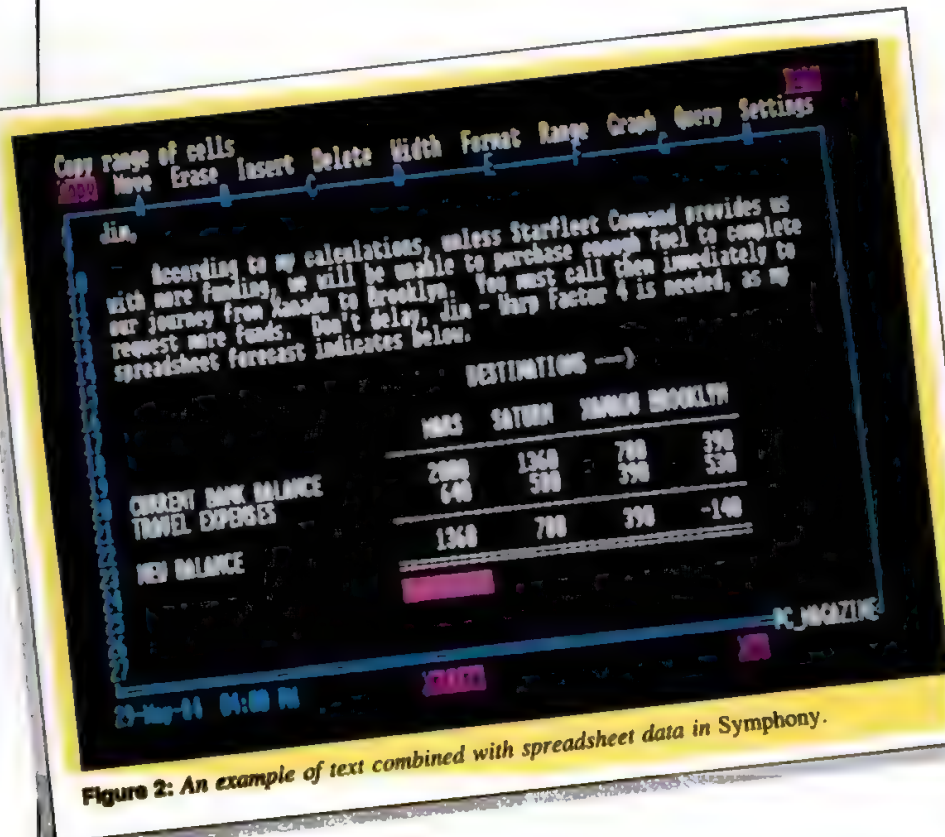


Figure 2: An example of text combined with spreadsheet data in Symphony.

### Data Is Data

The relationship between the document in Figure 1 and the worksheet that stores the data for all *Symphony* environments is portrayed in Figure 2. While in the word processor, you press the TYPE key sequence (Alt-F10) and select SHEET to convert the document window into a spreadsheet. Note the change in the window frame. The top border of the window, which is a format line in the DOC environment, indicates the columns of a spreadsheet, and the left border indicates the spreadsheet's rows. The indicator at the top right of the screen has changed from DOC to SHEET.

The text looks essentially the same in a SHEET window. In the spreadsheet context, though, each line of text occupies a row of the spreadsheet. Because this is a SHEET window, you can put numbers and formulas into the cells of the spreadsheet to develop a revenue forecast.

You'll feel right at home in the SHEET environment if you are familiar with 1-2-3. The commands are generally the same, and *Symphony* retrieves 1-2-3 worksheets directly. Only the macro language is different. The spreadsheet command line includes, for the most part, commands that are available in 1-2-3.

*Symphony* contains 1-2-3 features such as sorting the spreadsheet, "what-if" tables for sensitivity analysis, database querying, variable column widths, distribution tables, and multiple iterations, and it has some new features as well. *Symphony* includes 70 formula functions—financial, statistical, logical, mathematical, string, calendar, and special purpose—that perform automatic computations.

Among the most important additions to 1-2-3's repertoire are character string functions. If you have a string of characters, you can use these functions to dissect it into substrings. One application for this

capability is in coded numbers. For example, in an invoicing system you might have a six-character alphanumeric code that uniquely identifies each invoice (such as NY256A). The first two letters of the code (NY) indicate the state in which the item was sold. The next three numbers (256) constitute the invoice sequence number. The last letter (A) is the initial of the person being invoiced.

If you wanted to determine whether to charge sales tax on a particular invoice, you would need to look at the state code separately. For similar reasons, you might need to break up the invoice code in order to identify the other two subcodes. String functions like @LEFT, @RIGHT, and @MID allow you to extract the left-most, middle, or right-most characters of a given character string.

You can concatenate strings in the spreadsheet as you would formulas. If cell A1 contained the word *far* and B1 contained *fetched*, then storing the formula +A1&"-"&B1 yields the

**“**  
*Symphony* is very powerful—and cluttered. 1-2-3 is a gem; it's clean—the best designed integrated package ever. It's a work of art, a classic. *Symphony* stacks features on top of 1-2-3; it is confusing. Although *Framework* is complex, the package fits together.  
**”**

**ADAM GREEN**  
 noted dBASE II teacher



string "far-fetched." If you had a string, such as Widget Corporation, in cell J10 and used it in a report title in one area of the spreadsheet, you could use this same string as the title of another report (in cell F1498, for instance) by storing the formula +J10 in cell F1498.

### A Form Orientation

*Symphony's* database management program is a vast improvement over 1-2-3's, although it's not quite as simple to use as the other modules in the package. The database manager is forms oriented; you create a database by designing an electronic form on the screen containing the items that make up a record. After creating this electronic form, you can enter records into the database by filling out forms.

A database is a collection of these completed forms. To review the forms, you need only give *Symphony* the name of the database you want to peruse. You can then browse through the set of forms by pressing the PgDn key to move to the next form and PgUp to backtrack to the previous form or by using commands to pinpoint particular records. *Symphony* handles computed fields, default fields, and edit checks, too.

You can sort the forms on three sort keys and perform database queries to locate a particular form or to select a subset of forms based on criteria that you define. *Symphony* has a particularly easy way of doing this; you call up a special blank form to the screen and enter selection criteria into the appropriate fields. To locate Shakespeare's *The Tempest* in a library catalog database, you would simply enter SHAKESPEARE, W. in the Name field and *The Tempest* in the Title field. You can also use logical comparisons and formulas to create much more complex criteria.

The forms-oriented approach disguises the fact that the database is actually stored in the worksheet as a set of rows, one row per record. If you want to view or manipulate the database as a

spreadsheet, you can do so by switching from the database environment to the spreadsheet.

### Coordinating a Symphony

*Symphony's* spreadsheet is perhaps the most powerful one on the market today; the other environments, while not as remarkable, have enough depth to fulfill most software needs. But the magic of *Symphony* lies in using the various environments in unison.

The most important tool for imple-

selecting CREATE from the Windows menu (which you access through the Services menu), naming the window, and assigning it to one of the five work environments. The window may be any size you like; you use the arrow keys to control the length and width. You can place the window wherever you like on the screen. Windows can exist on top of one another or side by side.

You can have as many windows as you like, but if you put more than a couple of windows on the screen at once, your per-

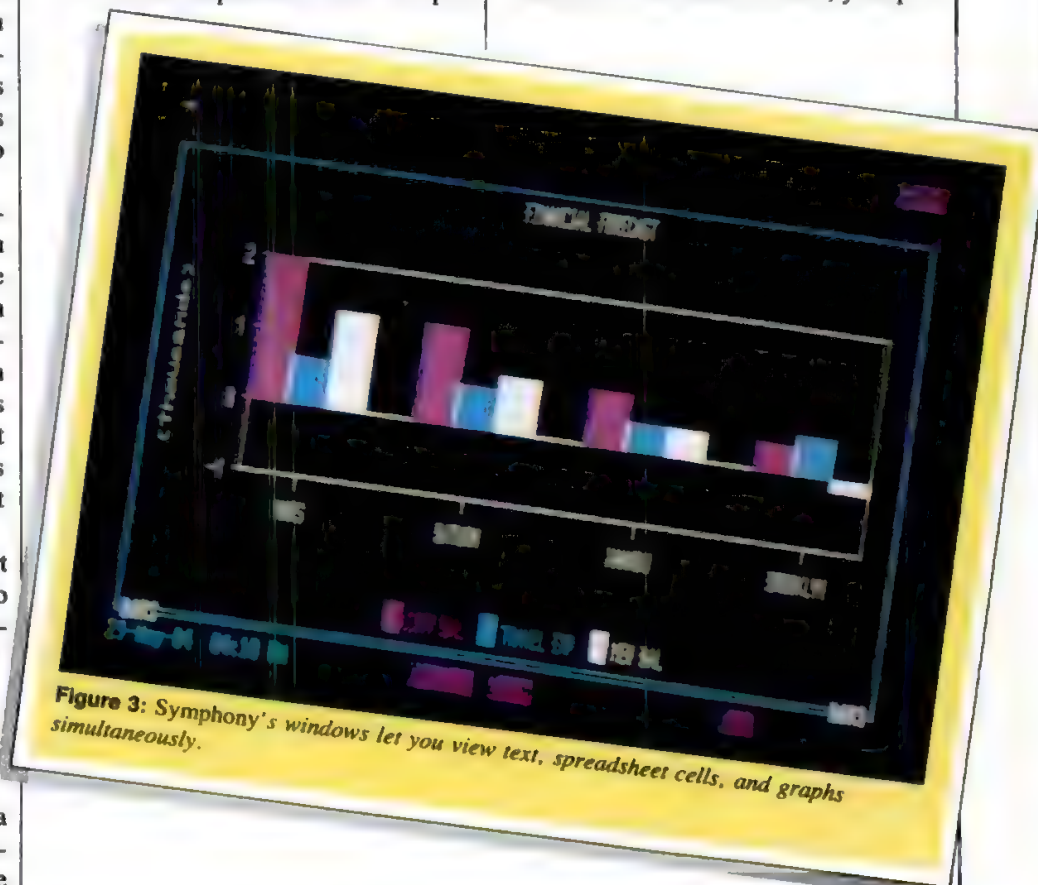


Figure 3: *Symphony's* windows let you view text, spreadsheet cells, and graphs simultaneously.

menting an integrated application is windowing. It is possible to ignore *Symphony's* windowing capability entirely, which is helpful for novices who want to start learning *Symphony* without complications like this one. However, when you begin to combine different functions, windowing allows you to display them on the screen simultaneously. You create a window by

spective in any given window will be rather limited. For example, if one of the windows is a document, you might want it displayed with other windows, but you might also wish to use the word processor exclusively with its window expanded to the size of the entire screen.

The Zoom key (Alt-F6) takes care of this problem. Point a cursor at any partic-



ular window, press the Zoom key, and that window will blow up temporarily to occupy the entire screen (see Figure 3). You may then work with that window as if the other windows did not exist. Press the Zoom key again and the window returns to its original state.

Windows are useful for integrated projects, but they also benefit single-function applications. If you use the word processor to develop a long document, you might use two windows to view two remote sections of the text that would not otherwise appear together on one screen.

Using windows, you could display a section of a database in one corner of the screen; reserve another corner for a spreadsheet window showing summary statistics derived from the database; use a word processing window that contains a table based on results of the spreadsheet; and display bar, line, or pie charts in other windows on the same screen. If you change an entry in the database window,

“Symphony is more than a logical extension of 1-2-3. The integration is more complete, closer to seamless. Its emphasis on document preparation makes it a worthy competitor to Jack2, the reigning champion of seamless integration.”

**BILL MACHRONE**  
editor, PC Magazine

“Ashton-Tate is aggressively marketing Framework, but this company is less well-known than Lotus, and many people aren't aware of it. Symphony is an extremely good product; it's what 1-2-3 should have been. Symphony's design will make it a leader. It's a strong product, and it's from Lotus, a company strong enough to act as a leader. It should do well because it has addressed criticisms against 1-2-3. It goes beyond and will overshadow other products like Context MBA.”

**ROBIN WEBSTER**  
West Coast bureau chief,  
PC Magazine

the other windows are automatically updated. That's what integration is.

Unlike window management programs such as *Desq* and *Windows*, *Symphony* is designed as a closed system. Its windows permit you to share information between environments, but you cannot directly use a *Symphony* window to run another software package.

The purpose of window systems is to facilitate the sharing and transfer of data between programs. They let you use your dedicated word processor with your dedicated spreadsheet in one integrated environment, but you must be familiar with the commands of both packages in addition to the window manager's own commands.

On the other hand, if you have an integrated package that already includes all the functions you require, you don't need to window your way through packages with totally different command structures. *Symphony* combines the data-sharing attributes of windowing with the economy of a uniform command structure.

### Symphony Communicates

*Symphony* doesn't ignore the outside world completely, though. You can

import ASCII files produced by other programs, such as word processors, into the worksheet. A *TRANSLATE* command converts *dBASE II*, *VisiCalc*, and *DIF* files into *Symphony* worksheets.

In the communications environment, you can use *Symphony* to exchange worksheets with another *Symphony* user over the phone line if you have a modem and an asynchronous adapter. You can also transmit or receive files from a mainframe computer or hook up to database services or electronic mail networks, and you can feed the incoming data into a range of the spreadsheet or get a hard copy on your printer. You can also teach *Symphony* how to automatically log on to an information service. It can dial an access number and transmit a password.

All of these bells and whistles are certainly nice, but *Symphony's* most exciting feature is the *Symphony* Command Language, which lets you tailor *Symphony* to particular tasks. Users of 1-2-3 will recognize this feature as the macro capability, but they will be delighted by the extent to which *Symphony's* macro powers surpass those of 1-2-3.

A macro is a group of *Symphony* com-



mands that are executed in a batch. The *Symphony* Command Language allows you to mimic any series of keystrokes you might press in a normal sequence of commands and entries. For example, if you issue a monthly consolidated sales report that involves combining ten sales spreadsheets into a summary table, you could store the appropriate keystrokes in a macro. Each month, *Symphony* would combine the files and print the report automatically.

The Command Language can do more than merely store keystrokes, though; it can be used as a complete procedural language. For the aficionado, it includes commands to loop within procedures, branch to subroutine procedures, beep the computer's bell, prompt the user for entries, perform conditional logic, control error processing, or place a phone call. You can even program *Symphony* to wait until a particular time of day before executing a procedure.

You can develop your own menus that function just like *Symphony* menus. When the user chooses an option from a menu you created, *Symphony* executes a procedure based on the option selected. You can create completely automated, menu-oriented templates for people who don't know how to use *Symphony*. With *Symphony*, Lotus has made it possible for anyone to be an applications developer.

### Not as Easy as 1-2-3

Given this myriad of features, *Symphony* is not "as easy as 1-2-3" to learn. While each individual environment is easy enough to pick up (the database is a bit more cumbersome to learn and use than the other environments), many users will suffer from feature shock. Beginners will have to take things slowly, starting with a single environment and easing their way into others. Learning *Symphony* is like learning to cook. It's easy to learn how to prepare a single dish. But becoming a master chef requires time, experience, and artistry.

To help you get started, Lotus has packaged a disk tutorial with *Symphony* as it did with 1-2-3. The *Symphony* tutorial consists of 16 lessons that run about 15 minutes each. The lessons are on an introductory level; though many users will appreciate this, most will look to manuals and third-party learning materials to make full use of the program.

*Symphony* is a memory-intensive pro-

*"Symphony has a slight advantage in that it is competing on Lotus' home turf; integrated software began with spreadsheets in mind. Framework isn't as focused on the spreadsheet, so it may not be as natural a progression for dedicated 1-2-3 users."*

**MIKE EDELHART**  
executive editor,  
PC Magazine

gram—the entire worksheet is processed in memory. On a Compaq equipped with 544K RAM, *Symphony* ate up 293K and left me 251K. If you have a 320K system, you may well bump against the memory limits of the system.

Since there is only so much RAM that you can pack into a PC, memory is the chief constraint of the software. The worksheet theoretically handles 256 columns and 8,192 rows, but in reality you can only use part of this grid because of the memory constraint. *Symphony* is therefore inappropriate for large production databases. On the other hand, the large memory

requirement means that *Symphony* operates very quickly. Calculation speed, screen paging, and tabbing are about as fast as 1-2-3. Pointer movement is slightly slower than 1-2-3 but not significantly.

If you have a monochrome display adapter, you cannot display graphics on the screen, although you can obtain hard copy graphs. An IBM color adapter, Hercules board, or Compaq will permit you to display text and graphs simultaneously, but the color adapter will not display color graphs if it must share the screen with text. If you want color graphs and text simultaneously, you must have a special supported graphics board such as the Plantronics ColorPlus.

While your monitor may be able to display *Symphony* text and graphs together, your printer cannot. At present, *Symphony* cannot produce a hard copy of text intermingled with graphs. Other packages have this capability, but they sacrifice resolution and output quality by using block graphics characters to produce graphs. Lotus opted for the higher quality of bit-mapped graphics. I would be surprised, though, if Lotus or another party did not probably develop an add-in program that resolved this limitation by permitting the entire bit-mapped display to be duplicated on a graphics printer.

At a list price of \$695, *Symphony* is at the high end of the integrated software market. With a \$200 exchange option, many registered 1-2-3 owners are likely to convert to *Symphony*.

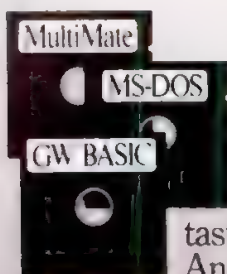
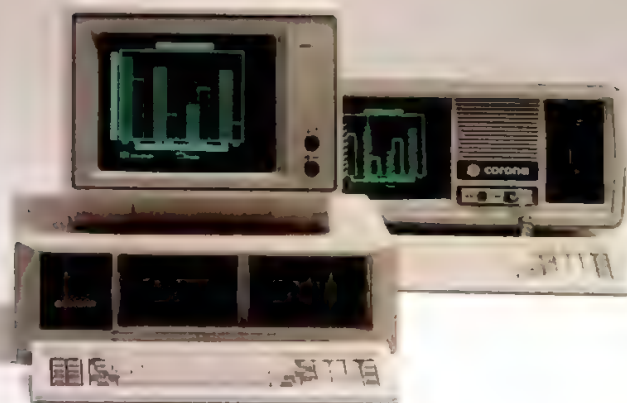
*Symphony* is likely to have a powerful effect on the integrated software marketplace. I predict that manufacturers of rival products will have to lower their prices in order to compete. This is good news for the user community: We will be able to buy more power for less money than ever, and the standards of integrated software will be raised on all levels.

Best of all, *Symphony* and programs like it give the common user the power to perform miracles. Software will never be the same. ■



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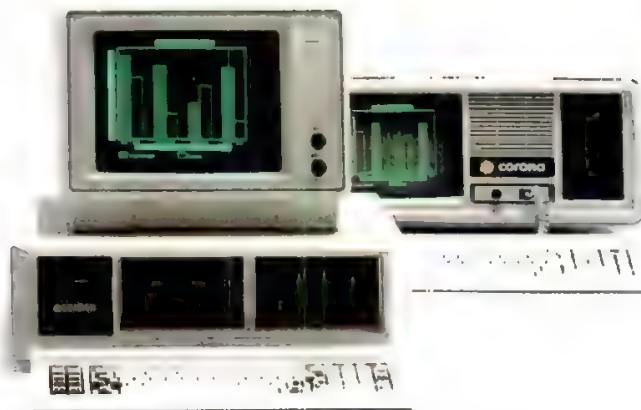
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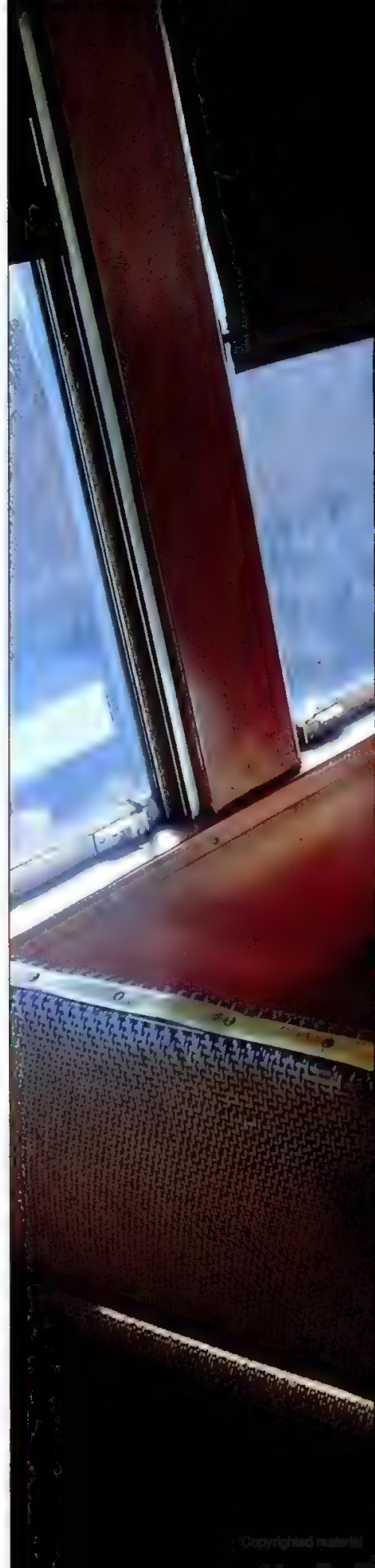
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Photograph: Dennis Kitchen









## SHARP PC-5000

**T**he real treasures of computer lap-land have always been out of reach. Most entries into the laptop market have either had toylike capacity or else have been extravagantly priced compared to desktop units of similar power. But Sharp Electronics Corporation has been quietly and effectively building its expertise in lap-sized computer technology. The result is the Sharp PC-5000, a laptop unit that not only rivals current desktop offerings in power and range, but also is priced competitively.

Weighing 13 pounds with optional built-in printer, this diminutive but stylish battery-operated unit contains enough internal memory to perform serious spreadsheet analysis, text processing, or code development. Its built-in bubble memory provides easy access to external data in the quantities that grown-up data appetites demand. Its fold-up LCD screen means that the convenience of visual interaction can follow you wherever you go. Devices such as disk drives, modems, and external printers can be easily attached when you settle down somewhere. Initial software released by Sharp includes a time scheduler, a versatile spreadsheet package, a text processing package, and a modem



The built-in printer on the PC-5000 takes thermal and plain paper.

communications support program. In addition, many of the programs made for generic MS-DOS machines will run quite comfortably on this machine.

Analyzing even a small machine is a big project. A look at the Sharp's innovative hardware, beginning with the video display, is as good a place as any to start. The video display is a heavily used unit on any computer system. Through it you get the straight scoop to and from your machine. The PC-5000's nontraditional, liquid-crystal display elicits strong reactions, both positive and negative. Of course, the beauty of any display screen is in the eye of the beholder—human preferences in this area are so varied that no single screen can satisfy everyone, and no real agreement on what to look for exists. For me, the three crucial elements are information bandwidth, legibility, and special effects.

The Sharp PC-5000's information bandwidth on a line basis is considerably less than on the typical desktop screen, measuring 8 lines by 80 characters in the normal mode. For many uses, these eight lines are plenty. Text entering, code construction, spreadsheet creation, and command entering all proceed easily, largely because the human mind doesn't often think in terms larger than individual lines when working in this way. Additionally, Sharp's release of Sorcim's *SuperTools*, which provide the basis for some of these activities, have been well adapted for the smaller screen size. Displaying intermediate clumps of creative work is a bit more of a chore, often requiring paging back and forth, which would usually be unnecessary on a larger display. This chore is aggravated by a relatively slow screen update. However, even large displays are not immune from these sorts of problems.

### PC-5000

Sharp Electronics  
10 Sharp Plaza  
Paramus, NJ 07652  
(201) 265-5600

**List Price:** \$1,995 (includes 128K RAM, monitor, BASIC ROM cartridge, 128K bubble memory cartridge and bundled software including *SuperTools* master menu, *SuperWriter*, and *SuperComm*). Dual 5¼-inch floppy drives are \$995, 360K battery-operated 3½-inch minidisk drive, \$695; 128K bubble memory cartridges, \$269; 64K RAM cartridges \$169; 128K RAM cartridges are also available. Printer optional, \$399.

CIRCLE 737 ON READER SERVICE CARD



And since the Sharp has a built-in printer, you can dump intermediate clumps of data to paper for inspection in a bigger frame. You soon develop a synergistic way of using the printer and LCD screen together to overcome the screen's bandwidth limitations.

On a dot basis, the LCD screen's bandwidth is easily as good as that of a typical desktop computer screen. For comparison purposes, if the LCD were expanded into a 25-by-80-line screen with the same dot density, it effectively would have 250 640 pixel characteristics. At its present size of 80 640 pixels, the Sharp PC-5000 can present graphs with excellent resolution (although the graphs are shortened in the vertical dimension when compared with conventional CRT displays).

The Sharp PC-5000's capability to tilt the display at various viewing angles is another plus. However, in order to obtain maximum legibility, the LCD must be carefully lighted. The contrast control helps compensate for varied lighting conditions, but the characters tend to lack punch even in the best of circumstances. Even in poor light, however, the characters are absolutely razor sharp and rock stable. There is no sign of the fringing, screen edge distortion, dot wander, heringbones, waviness, strobing, smear, or flicker that so often plague CRT displays. The characters are well formed and have a consistent visual density. Nonetheless, don't peer at the display for long stretches—get a good light instead.

The screen's special effects include light- and boldface characters in several different widths. I found that the boldface was the most readable. The reverse video and underlining features were completely effective. Cursor-driven programs presented a secure and convenient interface, and the menu effects provided by Sorcim's software made intelligent use of the screen options. The underlying screen manipulation commands allow rapid dot addressing, making animated screens practical. Obviously, the display's lack of a gray scale or color capability makes the

many applications requiring such facilities impractical.

### Bubbles

A few years ago, it appeared that bubble technology had burst. For a variety of reasons, several manufacturers had ceased supporting it. But this technology, which stores data by shifting patterns of magnetic regions (called bubbles) in special materials, has been successfully used by Sharp to give the PC-5000 a unique and



The bubble cartridges are cute, neat, robust little blue packages, which you may treat entirely like minidiskettes.

effective approach to portability of large data files. The PC-5000's main unit contains a slot that lets a bubble cartridge function as a pseudo disk drive. Using MS-DOS' virtual drive capability, that slot may serve as either the A: drive or the B: drive, with MS-DOS prompting for the appropriate bubble cartridge as needed. The bubble cartridges themselves are cute, neat, robust little blue packages, which you may treat entirely like minidiskettes. It is a good idea to load up the bubbles before a trip to give yourself the flexibility of extra data memory or convenient storage for application programs.

The bubble cartridges are absolutely silent in operation; a small light lets you know when one is accessed. The system places the names of the MS-DOS programs contained in the main unit's ROM into the directory of the bubble. That way, any bubble inserted in the slot always has in its directory an extra set of items that represent whatever ROMs are currently in

the unit. (Sharp has indicated that additional ROMs may be made available from independent vendors.) The bubble-storage space available to users is then tacked onto the end of those ROM items. It is not quite the 128K advertised, as some hidden MS-DOS system files, placed on the bubbles by factory preformatting, use up about 7K. The preformatting also buries a CONFIG.SYS file in the bubble. This burial makes CONFIG.SYS unchangeable except by sophisticated users who are familiar with MS-DOS system calls. This will probably not inconvenience typical businesspeople using the Sorcim *SuperTools*. My experience with the bubbles was positive; they are clearly the way to go for fully portable operation. I only wish they were cheaper.

### The Printer

In the bad old days of the IBM 1403 chain printer, the way you dealt with the printer noise was to make it cute. For example, you could make it print sequences that made tunes out of the print-hammer tapping. Printers have evolved considerably since then, and the Sharp PC-5000 printer is as much of a mechanical and electrical marvel as the 1403 was in its day. But, like the 1403, its performance is also tantalizingly short of perfection. It still makes you want to do cute things with it rather than take it seriously. Print quality, not noise, is the primary issue here. The printer's output is fine for draft copies of text, compiler listings, directory listings, memos and other lightweight stuff, but it's not an ideal choice for formal business letters.

The printer can use plain or thermal paper. In the plain paper mode, the heat of the thermal printhead causes carbon from a ribbon cartridge to be deposited on the paper. Sharp makes the perfect plain paper for its printer, but it is quite pricey. Paper designed to work with Brother thermal typewriters works tolerably well and costs much less.

Sheets of paper are fed one at a time, an operation complicated by the LCD unit,



which first has to be moved out of the way. In addition, the paper frequently catches on the ribbon cartridge as it comes around under the platen. Luckily, the paper advance itself works well, with complete freedom from skewing. For extended work sessions, though, it's probably best to use roll-fed paper.

The printer has such a high-resolution dot matrix for character formation that it is capable of producing extremely detailed and sharp characters, although individual letters are occasionally muddy or ill-formed. Printing on plain paper with the carbon ribbon produced the darkest characters, but thermal paper had the best character-to-character consistency, and I felt it was superior overall. The print fonts could use some redesign; for example the verticals on the *m* and *w* appeared too narrow in lightface caps and too heavy in lowercase bold.

Programmable options for two separate fonts in both boldface or lightface, along with three different page widths, are packed into the printer controller. A 149-column width allows printing remarkably readable (although necessarily tiny) characters on wide pages. Simple commands also allow the printer to duplicate information from the LCD as it comes up on the screen. The undocumented BASIC commands LCOPY 0, LCOPY 1, and LCOPY 2 allow you to dump the screen to the printer in three different formats. The printer uses a light-sensing mechanism to determine the end of the ribbon. Unfortunately, this mechanism is occasionally fooled into giving a false indication by the careful lighting required by the LCD. This problem, like the paper-catching glitch, can be solved with judicious applications of masking tape in the right locations, but it should never have existed in the first place.

### Digit Soup


Communications are critical to the usefulness of a portable computer. As part of its bundle of *SuperTools* software, Sharp provides Sorcim's *SuperComm*. This

package is integrated to work with Sharp's Direct Connect Modem as well as external modems. The Direct Connect Modem is a small, attractive unit that fits neatly into a recessed compartment in the LCD when not in use. The *SuperComm* menus and help screens are well implemented and a beginner doing routine communication with a remote computer should have no unusual troubles. Experienced people who must talk to a large number of computers each using unpredictably different communication protocols, or who have a large amount of data to move around, may feel frustrated by the program.

The Direct Connect Modem cannot auto-dial numbers of greater than 16 digits. If a person is calling computers via a non-AT&T long-distance service, the digit soup required may exceed the capacity of the dialer, making a large part of the automation provided by *SuperComm* and the Direct Connect Modem unavailable. The Direct Connect Modem does not support 1200-baud communication. Users with large volumes of work to do away from home base might want an external modem capable of that speed. Unfortunately, using an external 1200-baud modem presents its own problems. The update speed of the LCD screen is quite slow, requiring the Sharp's CPU to do considerable buffering of received characters. If the host is sending characters at a good clip and you want to stop the characters with a termination sequence, the Sharp has to empty its buffers to the screen before it can send your sequence. So, despite the speed advantage offered by 1200-baud communication, you still wind up being trained in patience.

Although the *SuperComm* manual does warn you, there is no excuse for the printer dropping characters at 1200 baud when you tell *SuperComm* to duplicate screen contents to the printer as they are displayed on the LCD. Also, *SuperComm*'s failure to keep the screen tidy when performing this duplication is inexcusable. The options menu for setting up the communication protocol has the nice feature of

remembering the last setting you used. But the options menu is not organized for frequently changing protocols. It does not remember the position in the list of the last option you changed. It is annoying to be forced to go through a seven-key sequence for every parity combination you try as you experiment to see which one works on the number you just dialed. Finally, while *SuperComm*'s menus provide hand-holding access to many MS-DOS facilities, at times some facilities lie outside the bounds



There is no excuse  
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printer.

of these menus. Changing contexts to get at such a facility without losing the remote computer is a 40-second exercise, with copyright banners, function key depressions, and requests for confirmation along the way. This same phenomenon occurs even within *SuperTools*, if, for example, you want to suspend *SuperComm* and go to *SuperCalc*<sup>2</sup> to prepare a spreadsheet for modem transmission. This design wastes too much precious time.

Receiving data from the remote computer is blessedly transparent; I didn't find any sequences that made the Sharp burp—that's a plus. But there was also no way to turn the transparency off so that the remote computer could send cursor control sequences that would affect the LCD screen. Under *SuperComm*, the Sharp PC-5000 can emulate only a dumb terminal. *SuperComm*'s send/receive protocol for files is primarily a Christensen protocol (known also as XMODEM) that is popular



but not universal. A prospective user of *SuperComm* should verify that the remote computer in question supports this particular protocol.

The Direct Connect Modem can also be used as a numeric keypad for data entry. Because of its built-in microphone and speaker, it also functions as a hands-free telephone. Voice quality in the hands-free mode was exceptionally good in both directions, but a slight background whine emanated from the speaker and also from the phone line.

### Under the Hood

A stripdown of the main unit revealed a surprisingly spacious construction; nothing looked cramped or crowded. There were plenty of precision-stamped bracing members and the mating of bracing members was excellent, with accurate tolerances evident on all interconnecting members. For those of you who don't look under the hood, this bracing ensures that your Sharp will get where it's going in one piece. All construction was modular with easily separable subsystems. While *PC Magazine* has no standard drop test, I accidentally had the opportunity to test the robustness of construction. In my case, it occurred at an airport, when the shoulder strap of the carrying bag containing the Sharp main unit and disk drive suddenly broke, causing both units to drop about 2 feet onto concrete. The units suffered no damage.

Inside, four boards were visible: bubble driver, ROM, RAM, and CPU. The boards were of high-quality construction and no engineering patches were apparent. The boards were all well braced at multiple points. Electrical connections between them were made with sockets and ribbon cables. A NEC 8088 was used on the CPU board and NEC 4164 RAM chips were used on the RAM board. Two spare mounting pads were visible on the ROM board, so you might expect that future enhancements to internal ROM software are a possibility. The unit's size reduction was accomplished by avoiding the stan-

## PERFORMANCE CHART

	Excellent Points	Good Points	Annoyances	Needs Work
<b>HARDWARE</b>				
Main Unit	<ul style="list-style-type: none"> <li>• Keyboard touch</li> <li>• Compactness</li> <li>• Colors &amp; visual appearance</li> </ul>	<ul style="list-style-type: none"> <li>• Weight</li> <li>• Operating time on battery</li> <li>• Price</li> <li>• Construction</li> <li>• Expandability</li> </ul>	<ul style="list-style-type: none"> <li>• Slow speed</li> <li>• No 8087 processor</li> </ul>	
Printer	<ul style="list-style-type: none"> <li>• Dot detail</li> <li>• Size of unit</li> </ul>	<ul style="list-style-type: none"> <li>• Flexibility of fonts and widths</li> <li>• No skewing</li> </ul>	<ul style="list-style-type: none"> <li>• Paper loading</li> <li>• Speed</li> <li>• Special paper needed</li> </ul>	<ul style="list-style-type: none"> <li>• Consistency of character quality</li> </ul>
LCD	<ul style="list-style-type: none"> <li>• Solidity and sharpness of image</li> <li>• Tilt feature</li> </ul>	<ul style="list-style-type: none"> <li>• Character shape</li> <li>• Resolution</li> <li>• Flexibility of fonts &amp; widths</li> </ul>	<ul style="list-style-type: none"> <li>• Contrast</li> <li>• Size of display</li> </ul>	
Bubble Memory	<ul style="list-style-type: none"> <li>• Convenience</li> </ul>	<ul style="list-style-type: none"> <li>• Physical size of cartridge</li> <li>• Robustness</li> </ul>	<ul style="list-style-type: none"> <li>• Can't adjust CONFIG SYS file</li> <li>• Space taken by system files</li> <li>• Limited storage capacity</li> </ul>	<ul style="list-style-type: none"> <li>• Price</li> </ul>
Mini-Floppy	<ul style="list-style-type: none"> <li>• Reliability</li> </ul>	<ul style="list-style-type: none"> <li>• IBM format compatibility</li> </ul>	<ul style="list-style-type: none"> <li>• Noise</li> </ul>	<ul style="list-style-type: none"> <li>• Hard disk add-on capability</li> </ul>
Modem	<ul style="list-style-type: none"> <li>• Size of unit</li> <li>• Voice quality</li> </ul>	<ul style="list-style-type: none"> <li>• Appearance</li> <li>• Numeric keypad</li> </ul>	<ul style="list-style-type: none"> <li>• Whine</li> <li>• No built-in 1200 Baud</li> </ul>	<ul style="list-style-type: none"> <li>• No more than 16-digit</li> <li>• Auto-dial capability</li> </ul>
<b>SOFTWARE</b>				
Documentation	<ul style="list-style-type: none"> <li>• Sorcim <i>SuperTools</i></li> </ul>			<ul style="list-style-type: none"> <li>• MS-DOS manuals</li> </ul>
Communications	<ul style="list-style-type: none"> <li>• Easy for novice</li> </ul>		<ul style="list-style-type: none"> <li>• Tortuous context shift to MS-DOS or other tools</li> </ul>	<ul style="list-style-type: none"> <li>• Drops characters on printer at 1200 baud</li> </ul>
Spreadsheet	<ul style="list-style-type: none"> <li>• Tutorial</li> </ul>	<ul style="list-style-type: none"> <li>• Versatile</li> </ul>	<ul style="list-style-type: none"> <li>• No macros</li> </ul>	
Text Processing			<ul style="list-style-type: none"> <li>• Tortuous context shift</li> </ul>	
Other		<ul style="list-style-type: none"> <li>• Alarm system</li> <li>• Menu layout &amp; function key consistency</li> </ul>	<ul style="list-style-type: none"> <li>• Not entirely PC-compatible</li> </ul>	

This table summarizes the various features and flaws of the Sharp PC-5000. "Excellent Points" are astounding, mind-boggling qualities that you should drop everything and write your mom about. A favorable mention of the machine's "Good Points" the next time you are at a cocktail party will indicate that you are a member of the Inner Circle. Items in the "Annoyances" category are the ones that you wish would really just quietly go away because they form an unsightly blot on an otherwise well-crafted instrument. Finally, whoever was responsible for approving an omission, bug, or nonfeature labeled "Needs Work" lacks discriminating taste, common sense, and foresight, and all manner and number of the King's men should be assembled to fix this up as soon as possible—or earlier.



dard DIP ICs in favor of flat-pack and leadless carrier versions. Several custom components and hybrids were also visible. Shielding plates to prevent RF interference were everywhere, and some areas were double shielded. The power supply was in its own separate cage.

The keyboard was solidly constructed and well braced. A dust membrane under the keys keeps flying bits out of the innards. Like the other subassemblies, the LCD screen unit is completely modular. It is packaged internally with rubber damping to absorb shock. Several electrical components housed in the subassembly help drive the LCD display. Shielding plates were also visible in this unit.

The line printer, shock mounted in its own metal basket, contains three motors for control of paper advance and printhead motion. It has its own controller board that attaches to the main CPU board via a ribbon cable and, as a nice touch, a zero-insertion-force connector. Since the printer is a user-installable option, such a connector helps ensure that fumble-fingered users don't put stress on the ribbon cable.

## More Gas

Perhaps as a move to conserve power during battery operation, Sharp runs its 8088 processor at a speed below that of typical desktops. The prime number test used in *PC Magazine's* evaluation of other IBM compatibles (see the cover stories in *PC*, Volume 3 Number 6) took the Sharp about 2 minutes and 53 seconds compared to an IBM PC's 1 minute. A compiled C program that wrote a file of 20 records of 1,024 bytes each to disk 10 times took 61 seconds, compared to a PC's 55 seconds. Bubble-write time was about the same as the Sharp disk. The same number of read operations took 1 minute, 43 seconds on the Sharp floppy as compared to 58 seconds for an IBM PC. Bubble-read time was 1 minute and 38 seconds.

The machine is a bit slower than the IBM PC all around. Normally, this wouldn't bother me in lap-sized device;

I'd be grateful to have anything at all. But since the Sharp is such a generally strong performer, I'm tempted to use it as a desktop workhorse. It sets such standards for itself in other areas that the impatient finger twiddling becomes annoying.

Average speed for the printer was about 14 characters per second in the 80-column mode. This is far less than the advertised 37 characters per second. While the print-head appears to move at the advertised speed as it forms characters, the carriage-return cycle drops the effective speed. Nevertheless, 14 cps is tolerable considering the printer's portability and flexibility.

Battery power provided about 6 hours of idle power-on time but only about half an hour of operation under a heavy combined load of the printer, bubble, and modem. The Sharp's main unit was impervious to pulling the plug while being powered from the AC pack—indicating a well controlled switchover from AC to battery operation. Floppy drives performed flawlessly, and somewhat quieter than the PC's drives. Extra RAM and ROM cartridges slip easily in and out of slots in the bottom of the main unit. These provide a nifty way to keep the software capacity from topping out early.

The PC-5000 has no provision for 8087 support, and a Sharp spokesman indicated that such support is not planned at this time. Regrettably, neither is hard disk support in the works. Soon to be delivered, though, is a battery-powered 3½-inch disk drive and a direct video interface for a full-size external monitor.

## PC-Compatible?

In a phrase, the Sharp PC-5000's PC-compatibility could be described as, "close, but no cigar." My tests revealed that the Sharp would generally run any PC-compatible commercial software that did not think an IBM screen was around. So, for example, the Whitesmiths and Lattice C compilers ran perfectly. On the other hand, programs such as *1-2-3*, *WordStar*, and *Flight Simulator*, which depend on the IBM screen characteristics, the

IBM diagnostic programs, or PC-DOS, would either give an error message on the LCD screen or send the machine off into hyperspace—from which recovery was possible only by powering down and up. IBM utilities such as DISKCOPY also caused hyperspace runs or failed to load at all. (The Sharp-supplied version of DISKCOPY, of course, performed satisfactorily.) *dBASE II* was somewhere in between. Most features worked, but browsing was problematic.

Reading and writing IBM-format disk-

The keyboard layout is different from the PC's, which is either a plus or a minus depending on your personal preferences.

ettes was more satisfactory. The higher density nine-sector diskettes could be read or written without a hitch. IBM single-density diskettes could also be read or written, but only if the original start-up boot was from the Sharp MS-DOS resident on diskette. If booting was done from the bubble version of MS-DOS, not even the directory of a single-density diskette was readable. This difference between bubble and diskette boot-program capabilities could be confusing. Copying files from bubble to diskette works only with the COPY command. DISKCOPY complained when asked to try.

The keyboard layout is different from the PC's, which is either a plus or a minus depending on your personal preferences. Key placement is more conventional for standard letter and special character keys. Some of the keys are bigger and thus easier to use for hunt-and-peck typists. Some keys found on the PC's keyboard are not



present on the Sharp and the Sharp implements some special features that have no equivalent on the PC. Especially interesting are the On/Off keys. These keys can be used to put the Sharp to sleep—either for a pre-set interval or until the On key is pressed. Upon waking, the Sharp will then do various programmable things such as start up communications or play tunes at you in a three-octave scale. The Sorcim *SuperTools* also provide access to this feature for calendar reminders. The PC's PrtSc key is missing, although the Esc-7 key combination is an undocumented escape sequence that causes the printer to display a remarkably miniaturized version of the current screen contents.

## UNIX Too

Encouraged by the Sharp's response to the standard tests, I devised an even more revealing compatibility test. Whitesmiths, Ltd., makes a multiprocessing multi-user UNIX lookalike called Idris. The IBM PC version of Idris runs as a "program" under MS-DOS, allowing concurrent access to both MS-DOS and the Idris multiprocessing facilities. Whitesmiths does not officially support a non-hard-disk version of Idris. The company's position is that a typical user will want to have on-line all 1.7 megabytes of utilities, compilers, text-processing stuff, and other wondrous goodies. It is a well-kept secret, however, that Idris will actually run on anything except a pop-up toaster.

How does Idris do on the Sharp? By diligently extracting salient intelligence from Whitesmiths' detailed installation guide for hard disk applications, I configured a creditable system running on the Sharp with only mini-floppy drives; there were, however, fewer goodies directly on-line. Even more interesting, after a little surgery on the bubble memories, I managed to further move Idris and a handful of utilities to the bubbles alone. Armed with a belt clip full of bubbles, the Sharp main unit, and an airline ticket, I took to the sky. I couldn't resist trying "cordless" Idris while on the plane. In went the MS-

DOS bubble to boot MS-DOS; in went the Idris bubble to get up Idris and its word processing software. In went the commands to set up a RAMdisk simulated under Idris. And there I had it, UNIX-type facilities on batteries and bubbles 20,000 feet in the air. I had fulfilled Tom Plum's prophecy of lap-size wonders from the UNIX world ("A Classy Idris in the UNIX Neighborhood," *PC*, Volume 3 Number 10).

## A Dying Boast

In Stanley Kubrick's classic movie *2001: A Space Odyssey*, there is a poignant scene where the last remaining human aboard the Jupiter probe vessel *Discovery* is forced to dismantle HAL, the great on-ship computer. Sneaking past HAL's safety circuits, the lone human slowly pulls out HAL's memory crystals one by one. As "his" mind is being removed piece by piece, HAL pleads for himself. As more and more crystals are removed, HAL's speech becomes less and less organized until, finally, the once-proud HAL is reduced to being capable only of singing a child's nursery rhyme.

The designers of the Sharp PC-5000 have included no such swan song. If you pull out all the bubbles, disconnect all the disks, remove all the RAM extensions, and defeat the ROM cartridge, somewhere deep in the heart of the Sharp PC-5000, a special circuit is activated. The Sharp goes into COMDEX mode. It begins to display a feature list replete with function-key-driven menus, graphic whizbangs, and sales-oriented narrative. HAL went down garbling a nursery rhyme. The Sharp PC-5000 goes down boasting, as well it should, for it is a nontrivial, feature-laden unit at a competitive price. ■

*Roland Racko teaches UNIX and C language around the country. He also advises OEMs on systems analysis, hardware design, and software quality while still finding time to write code for Status Software. He first touched a computer console on an IBM 650 in 1960.*



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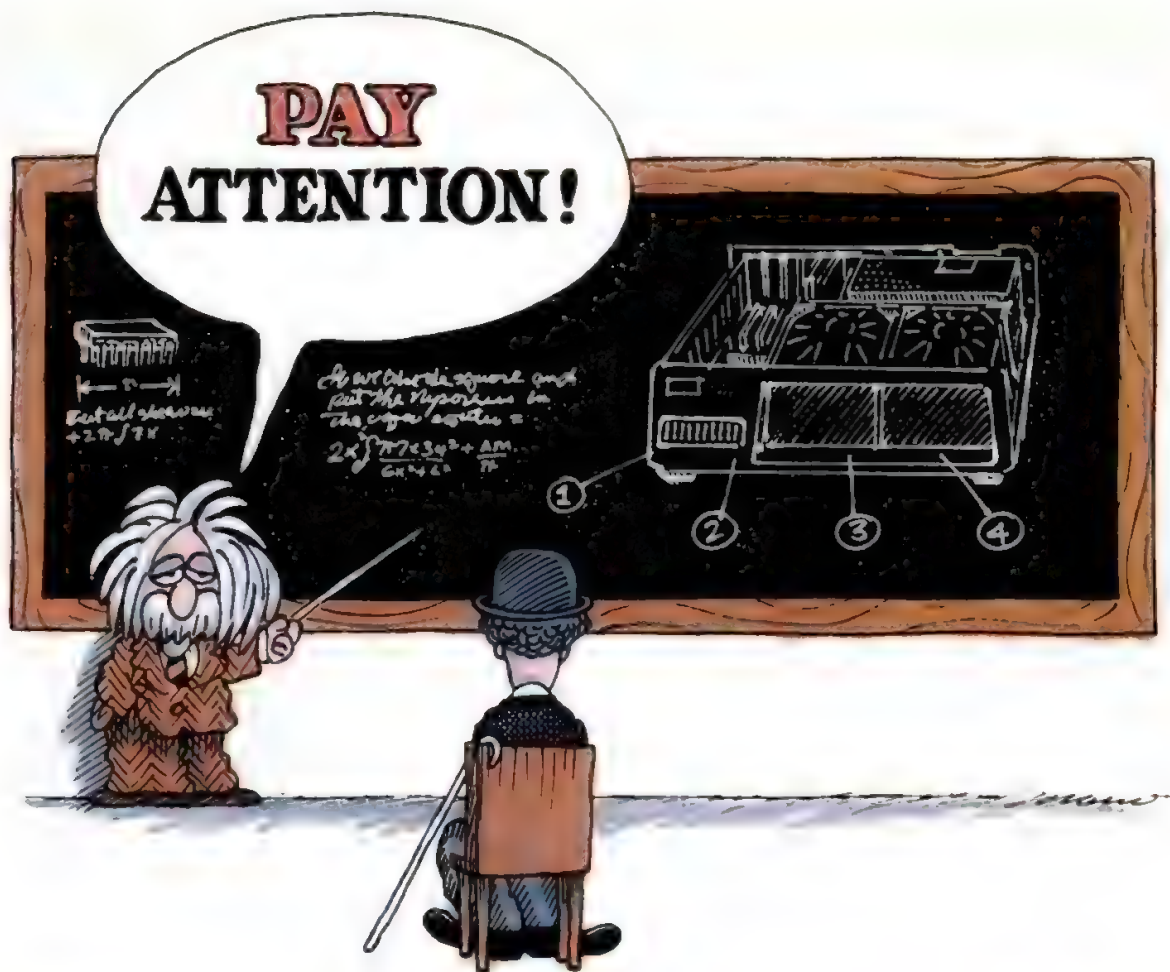
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your spreadsheet program. *Please* will even look up a name and company for you, your Hayes Smartmodem\* will dial the phone number, and you're ready to talk!

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*Please* can automa-

tically compute each salesman's commissions, and print them out in a report of your own design. All this and more, just for saying "Please."

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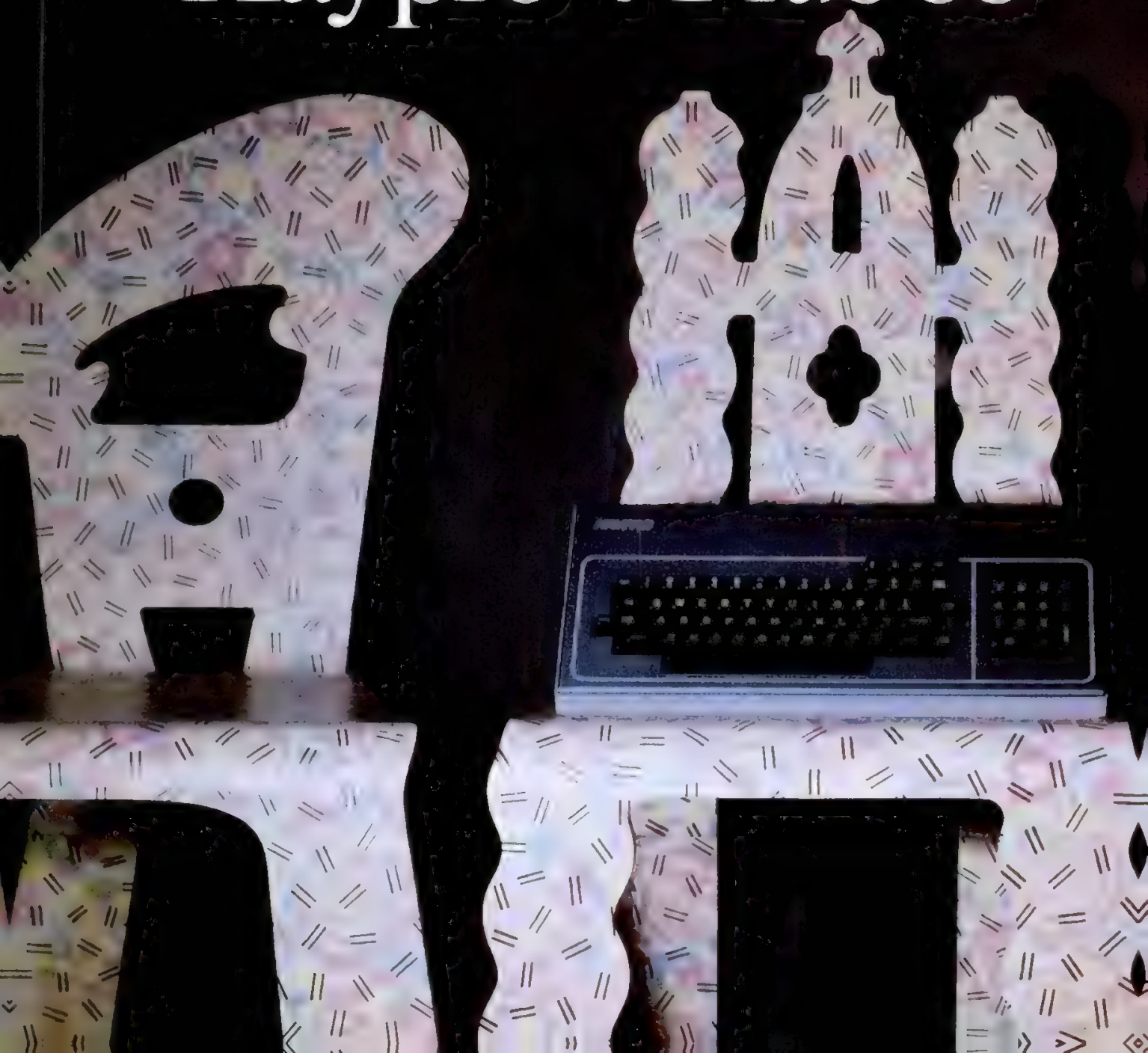
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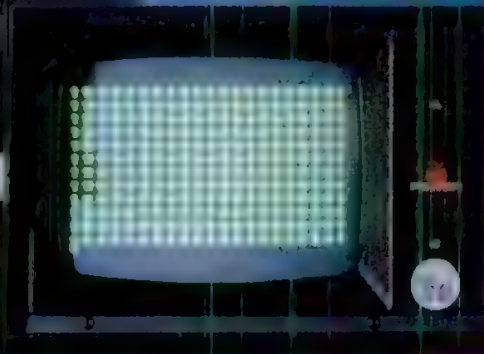
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# CP/M and DOS: At Home in the Kaypro 4 Plus 88





The Kaypro 4 Plus 88 may not be sleek or elegant, but it's an inexpensive, workable combination of CP/M capability and at least a limited amount of DOS compatibility.



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Kroll International, NY.



## KAYPRO 4 PLUS 88

**T**he battle for supremacy between DOS and CP/M started when the IBM PC was introduced in 1981. Despite the remarkable success of the PC (and DOS along with it), and despite more than a few premature predictions of CP/M's demise, CP/M is still going strong. The operating system battle shows little sign of ending soon, but a few computer companies, on both sides of the front, are calling for a truce by producing machines and/or software that are acceptable to both types of operating systems. One of the latest machines to attempt this compromise is the Kaypro 4 Plus 88.

The Kaypro 4 is essentially a CP/M system microcomputer. It uses a Z-80 CPU with two 5¼-inch double-sided, double-density disk drives with 400K of storage each. The "Plus 88" means the Kaypro 4 has added a coprocessor board with 256K memory, which, under CP/M, can act as a RAMdisk. It also enables the Kaypro 4 to be used as an Intel 8088 with that same 256K memory.

Physically, the computer's appearance is rather startling. During the last few years, the trend has been toward packaging microcomputers in cases with clean plastic lines—preferably in tan or beige. Somewhat defiantly, the Kaypro's stark, retro-tech, military-gray metal box harks back to World War II.

### Portable?

Like other Kaypro computers, the 4 Plus 88 is "portable" in the sense that it is about the size of a small sewing machine, weighs about 27 pounds, and comes with a carrying strap. It is propped up to a comfortable viewing height by a thin metal stand that folds out from the bottom and

has a tendency to collapse if you accidentally push the computer in the wrong direction.

The front of the machine is protected by a shallow metal hood, presumably there to reduce screen glare. The computer has a 9-inch green monochrome monitor, two horizontal, half-height floppy disk drives labeled A and B, and a rather large red light that lets you know when the computer is in operation. It also has the usual smaller red lights on the disk drives; at least one light is always on, indicating the last drive that was in use. This can be disconcerting if you're trying to determine whether the drive has stopped running.

The keyboard opens from the front in much the same way the keyboard on the Portable PC does, except that the Kaypro's keyboard is held in place by two plastic hinges on the sides. Made of molded metal, the keyboard connects, via a clip attachment, to the back of the computer and sits on a comfortable, but non-adjustable slant.

### Journalist's Favorite

Kaypro computers have become extremely popular with journalists and writers for several reasons. One is that the screen, although small, is very clear, and the 80 × 24 character display puts as little strain on the eyes as possible with this type of computer. Another reason is that the company's keyboards, including the 4 Plus 88's, are laid out in time-honored Selectric fashion. Anyone used to an electric typewriter will have no problem adjusting to the Kaypro 4 Plus 88.

Users accustomed to an IBM PC, however, may find the keyboard's format a bit puzzling. Like other CP/M microcomputers, it lacks function keys and an Alt key. In order to reboot, you must use the Reset button on the CPU itself (although hitting Ctrl-Del occasionally works, too). Also there is no Break key, so you must use Ctrl-C to break out of a program. Finally, the cursor keys are lined up in a row along the upper right-hand side of the keyboard. I found this arrangement terribly confus-

ing; my fingers are much happier with the more logical North-South-East-West format found on most microcomputer keyboards.

The Reset button (which reboots the machine automatically, taking the place of the more familiar Ctrl-Alt-Del) is a marvelous idea and is worthy of consideration by other computer companies. However, the button is inconveniently located on the back of the computer, so that every time I had to reboot, I had to reach uncomfortably over to the back of the machine. (This awkward placement might have been chosen to avoid "accidental" reboots, but any location not directly on the keyboard would have served that purpose.) The monitor brightness knob is also on the back, as is a serial printer or modem I/O port and a parallel printer I/O port.

Kaypro is known for providing a nice variety of software with its computers, and the Kaypro 4 Plus 88 is no exception. Along with the CP/M and DOS system disks, the package includes S-BASIC, CBASIC, and BASIC-80; *WordStar*, *Word Plus*, and *Perfect Writer/Speller* with tutorials; *Perfect Filer* and *Perfect Calc*; and *Sup'r Terminal*, a modem program. These are all CP/M programs. All the manuals come in neat, bound books—no binders. The only exception is the photocopied addendum to the user's manual, which contains the extra instructions and directions needed for the 4 Plus 88, including how to install and use the DOS functions.

### What About DOS?

The DOS functions are what make the computer so interesting. But the conversion of the Kaypro 4 into a DOS-compatible computer will not necessarily make serious DOS users happy. It goes without saying that a machine that needs to have its CP/M system running in order to boot DOS is bound to have some drawbacks. Since I was exclusively interested in testing the Kaypro 4 Plus 88's DOS capabilities, I devoted most of my time with the machine to examining its use of that oper-



**Kaypro 4 Plus 88**  
Kaypro Corporation  
533 Stevens Ave.  
Solana Beach, CA 92075  
(619) 481-4300  
**List Price: \$2,495**

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ating system. And I immediately ran into problems.

In order to boot up DOS, you must use three separate disks. According to the addendum to the manual, the procedure should go like this: First, after you turn on the machine, you get a message that asks you to please place your diskette into the A: drive. You then boot up CP/M. Once that is done, you remove that disk and insert the CP/M To DOS disk and type:

MSDOS.

You then insert the DOS disk, and you're (finally) in business.

With all due respect to the addendum, I found that the machine was just as happy booting up from the CP/M To DOS disk, thus reducing my juggling act by one-third. However, "just as happy" is a relative term here—it took an average of three reboots for the first CP/M boot to "take," an experience I found rather frustrating. And, of course, if you are working in DOS and suddenly need to reboot, you've got to go through the whole procedure all over again. (In fairness, I must mention that I later discovered that the rebooting problem was due to an easily fixed loose connection in the wiring.)

According to that same addendum to the User's Guide (dated March 14, 1984), to format a disk for MS-DOS, you are supposed to type:

FORMAT B: /D/S

where the D indicates a double-sided disk. However, when I tried to follow the instructions, the Kaypro 4 Plus 88 kept telling me to put the DOS disk in the A: drive. Since I was under the impression that the disk was already there, I called Kaypro's software support people and asked for advice. I was told not to type in /S—for some reason, the system command simply didn't work. Apparently, the idea is simply to format (using /D) and then, if you need any other files on the disk, copy them.

I did so and then attempted to diskcopy the DOS disk onto the newly formatted

disk. The computer told me that it couldn't oblige—that the source and target disks did not have the same format. Another support person at Kaypro told me that all of the Kaypro 4 Plus 88's DOS disks had been sent out on 8-sector diskettes and

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While the Kaypro's 8088 can perform pure MS-DOS functions, it can't really simulate the PC environment.

---

therefore could not be copied onto 9-sector diskettes. The suggested solution was to do a COPY \*.\* (which copies all the files on the disk).

### Smoother Sailing

Luckily, the rest of the testing went more smoothly. The Kaypro ran MS-DOS 2.0 and PC-DOS without a murmur and also had no objection to *dBASE II*. It would not run *WordStar* or any of the BASIC systems that were available. According to Kaypro, it will run properly configured GWBASIC and Version 3.3 of *WordStar*, among other DOS programs. The Westico Company, a software producer, has manufactured a series of over 100 packages that will run on the Kaypro 4 Plus 88. Kaypro's support people can supply a listing of that software.

Westico supplied two examples of DOS software usable on the Kaypro 4 Plus 88: *WordStar* and BASIC-86. The *WordStar* program ran without a hitch, although the machine did seem to linger over each command, and a short paragraph typed on the Kaypro ran with little trouble on a PC. BASIC-86, which is a form of BASIC usually reserved for 16-bit CP/M microcomputers, also ran well on the Kaypro's DOS system. However, since this form of BASIC is not usable on most DOS machines, it could not be said to add much

to the Kaypro's compatibility.

In fact, the computer seemed quite balky when it came to most DOS programs. It tackled unexpected problems in one of two ways: either by running aimlessly for a few seconds and then giving up entirely (necessitating a full reboot) or by having at least some compassion and returning to the DOS prompt.

### The Reason Why

Once you remove the ten screws that attach the top of the Kaypro 4 Plus 88, you can see how cleverly the people at Kaypro have arranged their computer—and why its DOS capabilities are so limited.

The main board of the computer, which lies horizontally across the top, normally holds the Kaypro's Z-80 microprocessor. However, for the 4 Plus 88, Kaypro has instead plugged a much smaller miniboard into the socket. It holds the Z-80 chip and acts as a buffer or switch.

A bus cable leads from the Z-80 "daughterboard" to another board on its right. This 5½ × 7-inch construct is another computer—it holds the 8088 chip and 256K of memory (two 128K boards stacked on top of one another). When the machine is running DOS, the 8088 board is doing the work, and the Z-80 board is performing only I/O functions.

However, while the Kaypro's 8088 can perform pure MS-DOS functions, it can't really simulate the PC environment. It cannot perform any tasks that require direct interaction with the video controller, direct memory access, or serial communications. It also is totally incapable of anything requiring graphics. This deficiency accounts for the problems with most MS-DOS software.

The Kaypro 4 Plus 88 is an interesting and cleverly crafted microcomputer, and it should be of use to those who work primarily in CP/M but want some access to DOS. However, owing to the inherent nature of the machine, that access is severely limited, and it takes a bit of imagination to refer to this computer as "PC-compatible." ■



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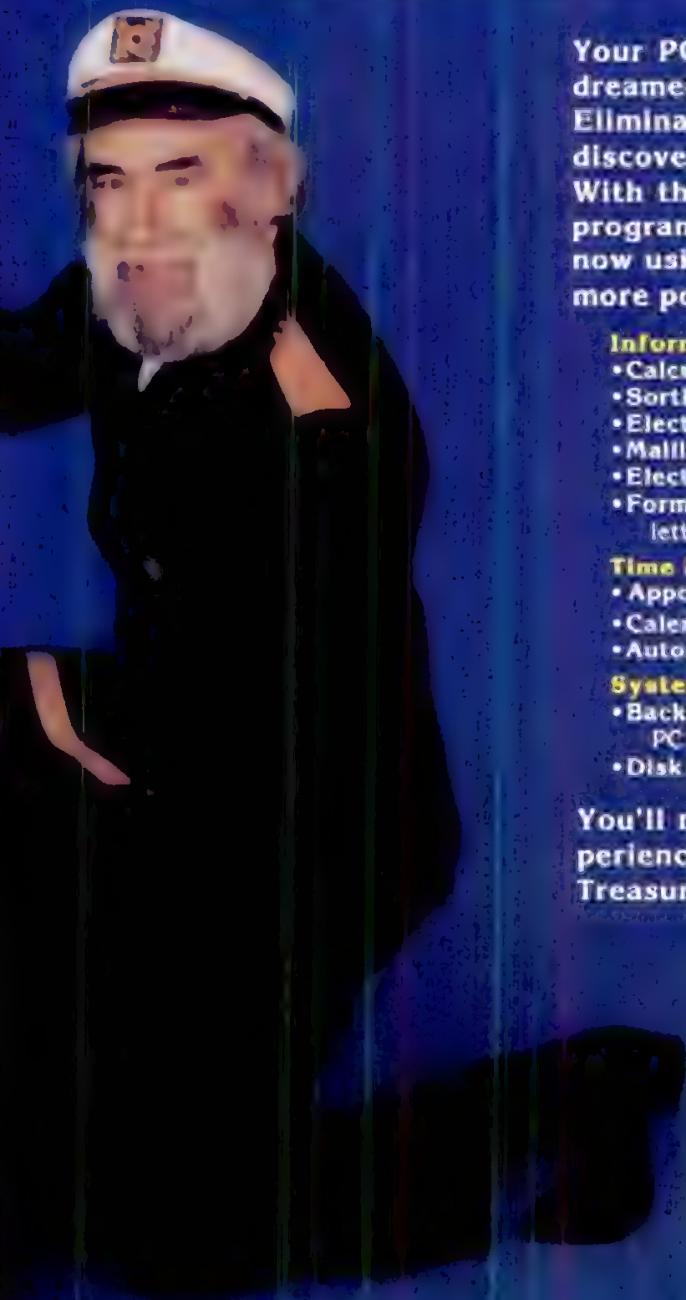


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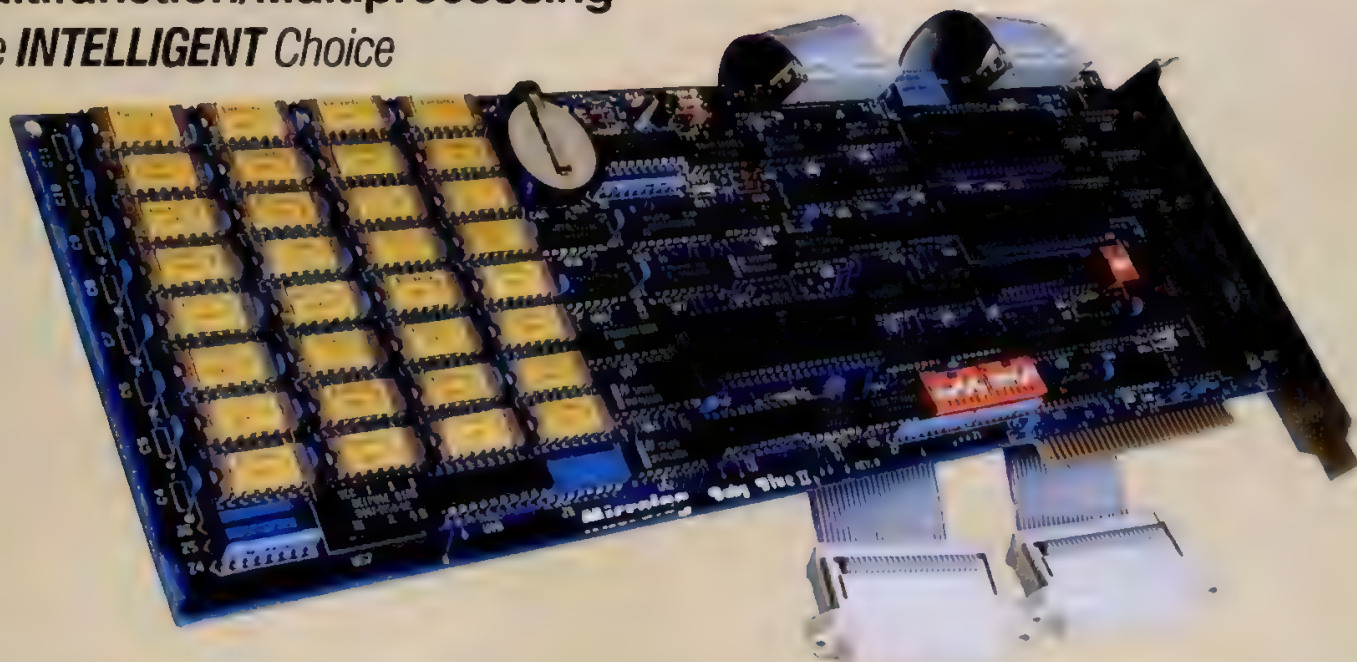
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### Systems utilities

**PDQ RAMdisk Software:** create a FAST pseudo-disk drive of any size in available system RAM. The DOS 2.0 version lets you change the size of your RAMdisk from the keyboard.

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**Smart Terminal Emulator Package (STEP):** talk to other microcomputers or connect to larger host computers, as an asynchronous terminal through Baby Blue II's serial ports. Unlike other "smart terminal" programs, STEP offers full emulation of popular video display terminals (the standard package includes Televideo 950 and Hazeltine 1500).

IBM 3101, DEC VT100 and many others are optionally available). You can send or receive text files, and with STEP's unique Sessions Menu, changing your configuration is a keystroke away.

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**Baby Blue Conversion Software:** Microlog's famous CP/M Emulator turns CP/M-80 programs into PC-DOS programs for fast, efficient execution on Baby Blue II. Completely transparent operation using standard PC-DOS commands—freely mix PC-DOS with CP/M programs and text/data files on the same PC-DOS disks.

**Convert:** supports bidirectional file transfer between PC-DOS and popular CP/M disk formats.

**Keyfix:** automates your keyboard with 54 programmable function keys for CP/M programs, eliminating tedious typing chores (max. 80 characters per key).

Baby Blue II (64K installed) . . . . . \$ 695.

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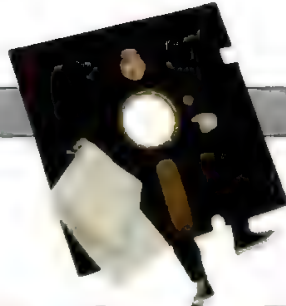
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# P R O J E C T: DATA BASE

## Part 5

PC Magazine continues its seven-part investigation of the database packages available for the PC. Here we review the first batch of Category 3 products.

**A**ll along we've been describing the database project as a six-issue series. But as we were looking over the articles on the Category 3 packages, we realized that each article was bursting with details of the myriad features of each product and replete with the opinions, likes, and dislikes of our various authors. We couldn't bear to omit any of this information. Not all of the Category 3 articles would fit into one issue—so now Project:

Database carries through seven issues. The Category 3 databases, those with a procedural language, are described in this *and* the next issue!

A procedural language is more than just a query language. While a query language allows users to ask questions about the contents of the database, a procedural or programming language enables them to use a set of criteria to dynamically control the processing flow.

In some packages, the distinction between a query and a programming language is blurred; the software uses a hybrid language that has characteristics of both types. Nevertheless, the inclusion of any procedural elements puts a database package in the running as a serious business tool and makes the step from Category 2 to Category 3 a huge leap in complexity and power.

—Stephanie Stallings



# FORMULA II: A Learning Experience

```

LAST NAME: Banning

EMPLOYEE NUMBER: 593830

DEPARTMENT NAME: Marketing


LAST NAME: Bradford

EMPLOYEE NUMBER: 694030

DEPARTMENT NAME: Marketing


LAST NAME: DiMeara

EMPLOYEE NUMBER: 194067

DEPARTMENT NAME: Data Processing

```

A sample *FORMULA II* report of employee and department information.

**F**ORMULA II is an "application creator"—a collection of program modules that you weave together into what you hope will be a useful application program. Because *FORMULA II*'s ready-made program modules may not be sophisticated enough for certain applications, the package includes a system programming language that you can use to issue commands such as LOOP and READ NEXT RECORD, just as you might include analogous commands in a BASIC or Pascal program.

*FORMULA II*'s developers clearly

## FORMULA II

Dynamic Microprocessor Associates  
545 Fifth Ave., #1103  
New York, NY 10017  
(212) 687-7115

List Price: \$695

Description: Relational

Requires: PC-DOS 1.1, 128K RAM,  
two disk drives.

Records per File: 999,999,999

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have come from a mainframe computer environment. Many of their design concepts draw on the manner in which mainframe programmers create large databases and application systems. Since *FORMULA II* is written in C, applications developed on a 16-bit machine under one operating system can be loaded and used on an 8-bit system very easily, according to the manufacturer. The documentation indicates that it is possible to run *FORMULA II* on machines using CP/M, CP/M-86, MS-DOS, or TurboDOS and employing Zilog Z-80, Intel 8088 and 8086, or Motorola 68000 central processors. Multi-user systems with these operating systems can also be accommodated by *FORMULA II*. A program called SETUP is used to install *FORMULA II* for each of these different machines.

*FORMULA II* comes on two disks, the Designer Disk and the Application Disk, that contain all the files necessary to design, develop, and save database application systems.

To boot the program, simply enter the

word *formula* and the A> prompt. The *FORMULA II* command processor screen will appear, containing the prompt Command to Execute, to which you must respond by typing in the name of a particular *FORMULA II* program module. If you intend to set up a data file, you need to use the FILEDEF program module, which enables you to specify the types of data you want to use in a file.

## Defining a Database

After you enter the FILEDEF command, a numbered menu gives you a range of options. Type D for database to begin entering the data field definitions. You supply a field name and then fill out a list of other field parameters: the field type, field length, upper and lower values for the field (which control the minimum and maximum values that can be entered in an application), number of decimal places floating-point numbers will have, and a special "restrict" parameter that controls the type of data that can be entered (N means that only numeric data can be entered and Y permits alphanumeric data, for example).

The data types allowed in a *FORMULA II* field definition include the usual alphanumeric, date, and numeric-only values; there is one extra option—the asterisk.

Like many other database systems, *FORMULA II* does not allow you to add fields to a file after information has been entered. Any attempt to do this will destroy all stored data. While this may be no problem with a small file, the prospect of re-entering 50 or more records is daunting. *FORMULA II* allows you to create dummy fields in a file by using an asterisk as the field type descriptor. These spare fields can be converted to real fields, without destroying file integrity.

After creating all the fields you need, you can set up an index for the file. When the prompt Key Field name appears, you can type in the field name that will act as the primary index key and the number of characters that should be used when indexing records. This latter feature allows for



quick indexing by the first two characters of a last name, for example, versus a more complete but slower index by the whole length of the last name. *FORMULA II* does not actually sort the records in files; it simply sets up a separate index file that contains all the information needed to store and retrieve records in some user-defined sequence.

A second prompt, Field Name for Second Part of 2 Part Key, allows two records with the same last name to be distinguished by their first names.

### Importing with UPDATE

According to the documentation, *FORMULA II*'s UPDATE feature can be used to transfer data from one file to another under certain conditions and with variable effect. You type the word *update* on the first line of the multilevel command line and then fill out the rest of the lines as shown below:

```

Program name:UPDATE
Parameter   :EMPTYFILE
Drive 1     :B
Parameter 2 :DATAFILE
Drive 2     :B
Option      :A/C/D/R/X
  
```

You have a choice of five different options in the last line. The A option adds a new record to EMPTYFILE from DATAFILE only if the records in DATAFILE do not exist already in EMPTYFILE. C copies records from DATAFILE into EMPTYFILE, creating completely new records as the update proceeds. The two files do not need to contain related fields. D deletes EMPTYFILE records that are contained in DATAFILE. One record is deleted for each record in DATAFILE. R allows a "reverse update"; the master file EMPTYFILE can update the transaction file DATAFILE, but only when fields in the two files have been related. Finally, X extends EMPTYFILE with new records from DATAFILE, regardless of whether some of the records already exist in EMPTYFILE.

One final option, not indicated above,

is to leave the final line blank. This is a normal update procedure; it rejects records in DATAFILE that do not already exist in EMPTYFILE.

I initially tried to use the C option to import the ASCII files supplied by *PC Magazine* into *FORMULA II* files that I created using the FILEDEF procedure. At first, the operation seemed to have worked, but after listing the file contents, I realized that something was wrong; every



record that had been imported was marked for deletion. I undeleted each record which caused the first line of each to be wiped out. It turned out that the import process was a little more complicated than the normal UPDATE procedure.

First you must create what *FORMULA II* calls an external file that contains all the fields the final file should possess. The second step is to create an internal file, which the program calls a database file, with exactly the same field parameters. Finally, you must rename your ASCII file so that the first eight characters match the external file you created and the extension is .EXT.

The UPDATE procedure looks first for the empty intermediate file that you created and then moves on to the .EXT file that actually contains ASCII format data. After reading the first ASCII record, UPDATE transfers it to the *FORMULA II* internal database file.

This method of importing data worked,

and it took about 21 minutes to import approximately 45K of data. The only practical limitation is that your ASCII file must consist only of data field contents separated by spaces and line feeds. Files with special delimiters such as double quotation marks and commas are difficult to import; most users will not want to perform the special formatting work that is necessary. However, data from *FORMULA II* files can be exported with any special ASCII characters embedded.

To look at the data in a file, or enter new data, you must use the FILEPROC procedure. If you want to browse through all the records or look for a particular record, FILEPROC will read the specified file sequentially until it finds the required record.

Alternately, you can ask FILEPROC to look for data stored in an associated index file before it retrieves any record. If it finds an index file, FILEPROC identifies the keys that have been set and asks you to enter the exact value of the key fields it should use to find a match in the data file.

To look at data from more than one file, you can use *FORMULA II*'s linking facility. You will generally want to link file fields in *FORMULA II* applications when you have one file designated as a transaction file and another designated as a master file. The transaction file can then be used on a daily basis to record such events as bills paid or employees promoted. At a regular interval—every week or month—you can use this transaction file data to update the master file. The links are set up via the same screen with which you created individual field definitions earlier.

Along the bottom of the field definition screen is a separate area where you enter linking information. If you had just defined a field called LNAME in the transaction file and wanted to link it to the masterfile, the bottom section would look something like this:

Related File Update Data		
File	Field	Opr
Masterfile	LNAME	R



This message indicates that data stored in the LNAME field of the transaction file should replace the data stored in the LNAME field of MASTERFILE whenever you go through an update procedure.

Transaction fields also can be added or subtracted from master fields (numeric data), or they can force the UPDATE procedure to search for a key field in the master file that matches the transaction file field value.

As the *FORMULA II* documentation correctly points out, "the 'bottom line' of an applications software system is the data it produces." In addition, the system, not the user, should perform all the contortions necessary to produce good quality output.

To try and make things easier, *FORMULA II* includes a query language procedure that lets you extract selective information from individual data files without resorting to a report generator. The query language attempts to look as much like English as possible, and you can have your entries checked for validity by QUERY itself before they are executed. If you want to list a file on the computer display, you can type in:

```
DISPLAY DUMMYFILE, DRIVE B
```

To be more selective, you could enter:

```
DISPLAY DUMMYFILE, DRIVE B,  
SHOW FNAME, LNAME, ADDR,  
CITY, STATE
```

In this case, the program will display only those fields specified after the word *show*. Instead of *show*, you could also use the words *showing* or *include* to achieve the same results. The QUERY procedure ignores all punctuation.

Additional QUERY commands allow you to retrieve only record fields that meet specific values or fields that meet or fall within some logical condition. You can save a query string as a named disk file and invoke it whenever you need it.

You can also use QUERY to index files by any field name or combination of field names. The following sentence will create

a file called CITY.IDX on drive B: for DUMMYFILE:

```
DISPLAY DUMMYFILE, DRIVE B,  
BY CITY, SAVE
```

The word *save* tells *FORMULA II* to store as a disk file what would normally be the transitory index, held in main memory during the life of the query. Indexes can be nested to let you access a file by a combination of keys.

I found the QUERY procedure easy to use, if a little long-winded at times. Saving regularly used queries in disk files and using the free-form query language only for ad hoc inquiries seems the most sensible approach. And while punctuation is



The QUERY  
procedure is easy to  
use, if a little long-  
winded at times.

not compulsory, there is little merit in leaving it out; if you do, you may find it difficult to follow your own query strings.

### Report Generation

The FORMDEF and FORMPROC procedures are used to create reports. You enter FORMDEF via the main command line screen and select the Edit A Form option from a submenu. Next, you are asked whether you want to change the standard form parameters and whether you wish to change the names of the files that will be used in creating a form. The latter option allows you to include data from up to six files (one main file plus five other related files) in a report form.

By using a combination of main file field, related fields, and memory variables in a form, it is possible to produce satisfactory reports. With some extra effort, however, you can create reports that are quite impressive. The unusual thing about

FORMDEF is that it embeds procedural language into the report format. You can place loops, READ NEXT commands, logical tests, and math routines in between or actually tagged to fields.

As the flow of control progresses downward, these special statements are encountered and acted upon. A field may be printed a number of times before the next field is dealt with, completely new output fields may be created to display math calculations, or nothing may be printed until a special condition is met.

After creating and saving your FORMDEF file, you must use the FORMPROC procedure to preprocess or compile it. FORMPROC is a two-pass compiler that readies a form for printing and also compresses the data so it takes up less space on disk. Since compiled forms are unreadable by normal means, you can create applications that cannot be tampered with.

However, you must put a considerable amount of effort into learning the FORMDEF "language" before you can develop really useful applications. The novel idea of embedding programming commands among the fields that compose a screen display gives new meaning to the phrase "reading between the lines."

### Adult Education

Because of the time it took me to become adept at the FORMDEF language, I was unable to complete the tasks set by *PC Magazine*. *FORMULA II* clearly can handle those tasks easily—once you've given yourself a thorough education in the program's procedures.

*FORMULA II*'s powerful features make it fun to work with. However, the method of developing report form programs is too cumbersome. The QUERY language is useful, but it would have been more so if data could be extracted from more than one file at a time.

If you're dedicated enough, you could do a great deal of good work with *FORMULA II*, and in the process learn more about programming than you intended.

—Robin Webster



# MANAGER: A Procedural Pro

EMPLNUM	SALARY	CHANGEAMT	CHANGEMONTH	CHANGEDAY	CHANGEYEAR	PCTINCREASE
120390	30000.00	4200.00	10	10	82	16.3
120740	56300.00	6000.00	3	1	75	11.9
121020	34000.00	1900.00	2	24	81	5.9
121300	20000.00	6500.00	12	9	80	48.1
121300	25000.00	5000.00	2	1	82	25.0
121500	25000.00	8300.00	6	6	82	49.7
121500	35000.00	10000.00	1	10	83	40.0
121500	50000.00	15000.00	2	18	84	42.9
121790	19500.00	6000.00	5	1	81	44.4
122140	30000.00	4200.00	10	18	82	16.3
122490	56300.00	6000.00	3	1	75	11.9
122770	34000.00	1900.00	2	24	81	5.9
123050	20000.00	6500.00	12	9	80	48.1
123050	25000.00	5000.00	2	1	82	25.0
123330	25000.00	8300.00	6	6	82	49.7
123330	35000.00	10000.00	1	10	83	40.0
123330	50000.00	15000.00	2	18	84	42.9

This report shows the dollar amount and percent increases calculated with a 2-line **MANAGER** procedure.

It's a rare treat when a software package not only offers better features than the industry leaders, but offers them at a lower price. After giving **MANAGER**, from Call Manager, Inc., a workout, I concluded that this database offers more commands and more ways to implement them than most database managers on the market today, and all for \$195. That is a real price/performance bargain.

**MANAGER** has been in use on mini-computers for over 13 years and was introduced for the IBM PC last year. The result of 13 years of attention and use is a mature database system.

To run **MANAGER** you need to have an IBM PC, XT, or IBM workalike with two double-sided double-density (DSDD) floppy disk drives or one DSDD floppy

disk drive and a hard disk. You also need at least 128K of RAM, and DOS 1.1 or a later version.

Each data file can have up to 32,767 records. Records can have up to 50 fields (columns) of up to 255 characters each, as long as the total record length does not exceed 2,048 characters. **MANAGER** can sort on all 50 fields.

## Modes of Operation

**MANAGER** offers three ways to use its powerful commands: a menu system, command line entry, and procedures. The menu-driven prompting system is available for the first-time or inexperienced user. The menus lead you through all the commands and options available in the program. Even when the system prompts you for a file name, the available files for use are shown in a menu for easy selection. All the system parameters (printer specifications, color or monochrome display, data drive selection, and so on) are set up with the menu system.

Experienced users may opt to use a second mode of operation: entering the commands directly using a command line. You need only turn the menus off, and the **MANAGER** command prompt ( \*: ) appears for direct command entry. All the commands available with the menu sys-

tem are also active in the command line system. The advantage of this method is that it is much faster to choose and run commands directly than to use the menu system. **MANAGER** has an on-line help system that shows you the possible commands and their respective formats in case you forget. All the commands can be referenced by their full name or the first three letters—for example, the APPEND command can also be expressed as APP.

The third method of operation is to use "procedures." Procedures are groups of **MANAGER** commands together in one file. This file, classified as a text file, is run just like a batch file is run in DOS. You can create text procedures using the TEXT editor, part of **MANAGER**, or by "logging," or copying, all your selections from the menu system into a file.

The procedure method opens all sorts of opportunities. **MANAGER**'s procedural language has system and user variables, input commands from the keyboard or files, subroutines, GOTOs, and the like. There are also some special system functions that can be accessed for time, date,



change in dates, file size, field lengths, and other file and system parameters. Any of the commands that can be used from the menu system or command line can be used in a procedure.

## Data Entry and Modification

There are many different commands that allow you to add, edit, or delete data

### MANAGER, Version 4.0

Manager Software  
1961 Middlefield Way  
Mountainview, CA 94043  
(800) 227-6621  
(415) 964-5333

List Price: \$195

Description: Relational

Requires: DOS 1.1, 128K RAM, two disk drives.

Records per File: 32,767

CIRCLE 746 ON READER SERVICE CARD



##	Column name	Type	Width	
1	EMPLNUM	A	6	Data file name = C:\B3SALARY1
2	SALARY	N	6.2	Number of columns = 7
3	CHANGEAMT	N	6.2	Storage bytes per line = 32
4	CHANGEMONTH	A	2	Print line width = 46
5	CHANGEDAY	A	2	No. of picked up cols. = 0
6	CHANGEYEAR	A	2	
7	PCTINCREASE	N	2.1	
8				
9				
10				
11				F1 = Prev columns
12				F2 = Next columns
13				F3 = Copy
14				Alt F4 = Restore
15				F5 = Pick up column
16				F6 = Put down column
17				F7 = Delete column
18				F8 = Insert column
19				Alt F9 = Stop!
20				F10 = Do it
				Caps Insert off

The **MANAGER** data structures for the file reporting salary increases.

from data files. The first step in working with a database is to specify the fields that will appear in each record and the data types (alphanumeric or numeric) using the **CREATE** or **STRUCTURE** commands. The next step is to **GET**, or select, the data file to be accessed. The **CHANGE**, **INPUT**, and **MODIFY** commands allow you to change or add additional data records.

**MANAGER** allows you to specify which fields in the data file you wish to change—only those fields are displayed on the screen. You can select records to be erased using **DELETE**. When you are sure of your deletions, the **COMPACT** command erases the records selected using **DELETE** and renumbers the data file.

If you decide later to add or change a field, you can use the **REFORMAT** or **RESTRUCTURE** commands on the data file without first having to copy the data to a temporary file (unlike the **MODIFY** command in *dBASE II*). The **REFORMAT** and **RESTRUCTURE** commands leave the data alone unless you shorten the field width to the point that the data become truncated. **RENAME** allows you to change the name of a field within a data file. **DESTROY** will delete the entire file from the disk. The current data file field structure can be seen with the **SEE** command.

Another data entry command, **FORM**, allows the user to "paint" a Data Input

Form sheet for later data entry and modification. "Painting" lets you specify where titles, headings, other text, and fields will appear on the screen. In this manner, you can create standard forms that might resemble actual business forms that your personnel use in the office. You can choose colors, center text, and locate different fields on the form anywhere you desire—consider yourself a database artist. Each form can be up to six pages in length.

The last method of entering data is to first create an empty database with the **CREATE** command and then exit **MANAGER** and use the supplied **TRANSDb.EXE** program. **TRANSDb** takes data from other sources and transforms them into **MANAGER**-readable data files. The program prompts you for the specific delimiters used in the file and then translates the information quickly. A file in Standard Data Format with 500 records (89 characters in length, 7 fields) was translated into a **MANAGER**-readable filename.DAT file in 45 seconds.

### Data Manipulation

Once you have created a new database, either empty or with imported data, there are six basic commands that allow mass manipulation of data in that file or other files. The **COPY** command takes the data in the current file and copies it into another. **APPEND** takes a second file and

attaches it to the end of the current file. You can merge the data from two different files into one of the two or into a third, "destination" file. You can sort a file on one or all of the file's fields and have the sorted information overwrite the current file or sent to a secondary file.

The final two commands provide the real power and flexibility of **MANAGER**. The **LET** command allows you to assign values to the different fields in a record, or groups of records, for many different conditions. The other command, **CONSOLIDATE**, merges the information from one file into the same file or a secondary file using one of the fields as a key. The value of this command is that conditional merges can take place. You can choose to select the first, last, largest, or smallest value in a field to keep in the new merged file. For instance, let's say that **FILE2** has Employee Number and Salary as its two fields. The Salary field contains all the past salary figures that the employee has ever earned; thus there are many records with the same employee number but dif-

**MANAGER** offers three ways to use its powerful commands: a menu system, command line entry, and procedures.

ferent salary figures. You could consolidate the employee number and present salary figure (assuming the last salary figure in **FILE1** is the present one) into a secondary file called **PRESENT** by typing in:

```
CONSOLIDATE SALARY/0 BY EMPLOYEE  
NUMBER TO PRESENT;,  
NEW
```

### Data Reporting

Most users believe that the most important function of any database package is its



ability to create reports. In *MANAGER*, there are basically two steps in creating a report. The first is to perform any calculations and consolidations of data by using either the command line approach or using a procedure. After you have modified a file or created a new temporary file that contains the information you want, the PRINT command will create a standard report for the screen, printer, or a disk file. PRINT has many options to tailor the report to your liking. There are options for different form feeds, variable spacing between lines, subtotals, grand totals, grouping like data together, replacing repeated data with a character (space, quotation mark, apostrophe, or decimal point), and other format controls. As with other commands, PRINT can be invoked from the command line or by a procedure.

There is a second way to create a report. The Easy Report Writer (ERW), similar to a procedure, is dedicated to creating reports. It is used when more control over the report is desired than the PRINT command allows. The ERW has conditional commands and subroutine capability to provide for the many different types of report situations that might arise. The conditional commands, such as IF-THEN, only work with numbers at this time, but Call Manager says that string checking is planned for *MANAGER*. ERW is an interpretive-type program; that is, it has to re-evaluate each command every time it is executed. Since the re-evaluating process slows down the report writer, any computations or conditional data selection should be taken care of before using the ERW by using the LET, CONSOLIDATE, MERGE, and other data file commands, which can manipulate data very fast. A test procedure accessed six files (each file with a minimum of 500 records), performed three one-variable sorts, one two-variable sort, three LET assignments, two CONSOLIDATIONS, and destroyed two temporary files. It took only 7 minutes and 48 seconds on my PC with 320K RAM and a hard disk. (It took 15 minutes and 20

seconds when I used two floppy drives.)

### Ease of Use

The three different modes of operation available with *MANAGER* can be learned in progressive fashion. The menu system is easy to get started on. The manual provides a very basic example that walks you through how to use the menu system. When you are finally comfortable with the commands, you can exit the menu system and enter commands with more efficiency and speed using the command line and by running procedures. Some of the more powerful commands, like PRINT and LET, can be burdensome to use with their



Many a good program has the manual to blame for its downfall. *MANAGER's* manual could use some polishing.

many options, but that is intrinsic to their flexibility. Overall, *MANAGER* runs smoothly.

### The Manual

Many a good program has the manual to blame for its downfall. *MANAGER's* manual is not bad, but it could use some additional sections, some more explanation in places, and some polishing here and there. The main distraction was that Version 4.0 has various new commands and enhancements, and the descriptions of these new features came on 8½- × 11-inch sheets, while the manual is the IBM manual standard 5½- × 8-inch size. I had to switch back and forth from the large addendum sheets to the original manual. If the company does reissue the manual, it would also help if a nontechnical person would rewrite the documentation. The

information you need is usually there, but some details have been taken for granted where some additional explanation and examples would have really helped. An error section explaining error messages, causes, and possible solutions and a more in-depth tutorial covering all the commands (instead of just some of them) would also have been helpful. The manual does an excellent job of using colors to differentiate between user input (white), system prompts (blue), warning messages (red), system output and references (green), and headers (yellow).

### Strong and Weak Points

*MANAGER* provides a forms generation system (FORM) for inputting data but does not provide the same "paint" capability for reports. The ERW system that is provided is weak in certain areas—it runs slowly and does not allow string manipulations (even though the manual gives an example using strings). The manual, tutorial, and on-line help messages could also use some beefing up.

The good news is that the price for all that *MANAGER* has to offer is only \$195, well below most database packages offering this much power and flexibility. The system works well with few bugs, most of which were in the ERW and FORM command, which are fairly new. Call Manager says that a new version of FORM will soon be available to get rid of the few bugs. It will have some additional enhancements and will correct the ERW problems with strings.

Call Manager also plans to introduce a graphics system and an enhancement to the TEXT editor that will make it a full word processor. The combination of *MANAGER's* powerful database plus graphics and word processing should provide Call Manager with a solid package, especially if it keeps the price down. The company is also going to allow you to access up to 66 files when creating forms and building reports. I would keep my eye on this product; the future looks bright. —George D. Hughes, Jr. (continued)



## Input Screen Specifications

Method	Capabilities				
	No. screens per file	No. files per screen	Simulate paper forms	Link help messages/prompts to a field	Master/detail relationships
Fixed; field formatting possible only via report form development.	Limited by disk space.	Up to 13 files, including ancillary files, can be used in a single form.	Yes	Yes	Programmable
Can be automatic, "painted" or programmed according to circumstances.	Limited by disk space. Each form can be up to 6 screens.	1	Yes	Programmable	No
"Painted"	Limited by disk space.	1, but 32 files can be referenced.	Yes	Yes	Yes
Screen "painting" utility generates initial program source code. Programs you write can print the screen.	Limited by disk space.	16	Yes	Yes	Programmable
"Painted"/Programmed	2 screens per Quick Gen or Report Gen application.	2 files per Quick Gen application, 3 files per Report Gen application.	Yes	Yes	Yes
Automatic/Programmed	Limited by disk space.	Limited by disk space.	Yes	Programmable	Yes
Automatic in the standard QUERY/UPDATE model; "painted" in the PRO-MATIC programming environment.	9 data displays per program model.	3 file structures per program model.	Yes	Yes	Programmable



1. Follow instructions on the other side

Back

GbslipBack-0018

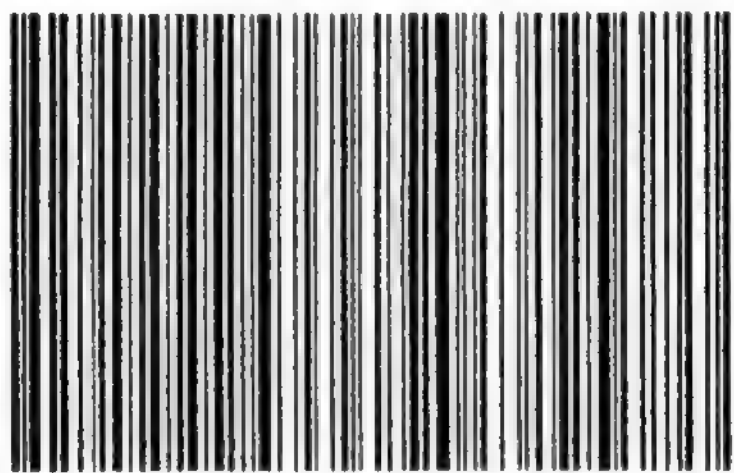


Inverted Back

1. Follow instructions on the other side



Folded edge of the page



Inverted Foldout slip-sheet

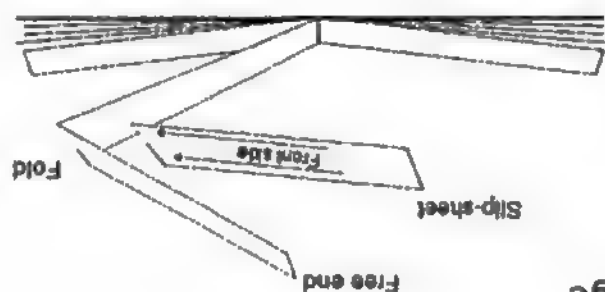
Foldout slip-sheet

1. Open the foldout page
2. Insert this sheet with

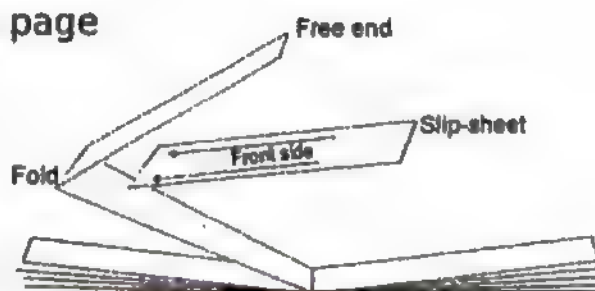
1. Front side touching the free page
2. Arrow pointing to the fold

3. Slice the folded edge

4. Close the page and slip-sheet



1. Open the foldout page
2. Insert this sheet with
  1. Front side touching the free page
  2. Arrow pointing to the fold
3. Slice the folded edge
4. Close the page and slip-sheet





Name	Data Model	Marketing Features		
		Length of Time on Market	Number of Sales	Price
<b>FORMULA II</b> Dynamic Microprocessor Associates, Inc. 545 Fifth Ave. #1103 New York, NY 10017 (212) 687-7115	Relational	Since October 1983	700	\$695
<b>MANAGER (Version 4.0)</b> Manager Software 1961 Old Middlefield Way Mountainview, CA 94043 (800) 227-6621	Relational	Since spring 1983	1,000	\$195
<b>DATAEASE</b> Software Solutions, Inc. 305 Bic Dr. Milford, CT 06460 (203) 877-9268	Relational	Since mid-1983	About 4,000	\$600
<b>THE SENSIBLE SOLUTION</b> O'Hanlon Computer Systems 11058 Main St. #225 Bellevue, WA 98004 (206) 454-2261	Linked indexed files	Since January 1983 for the IBM PC	4,000	\$695
<b>probase</b> probase Group, Inc. 2316 Artesia Blvd. Redondo Beach, CA 90278 (213) 374-7572	Relational	Since October 1983	About 2,000	\$300 for probase only; \$650 for probase plus the 3 generators.
<b>METAFILE (Version 7.0)</b> Sensor-Based Systems 1701 E. Lake Ave. Glenview, IL 60025 (800) 323-3731	Relational	Since June 1980	Over 5,000	\$995
<b>PRO-MATIC</b> RG Software Systems P.O. Box 426 Fort Washington, PA 19034 (215) 576-0970	Relational	Since January 1984	Confidential	\$595



# DATAEASE: An Awkward Powerhouse

EMP NUMBER	_____	(text, 24 long, indexed)
NAME	_____	(SS, 6.2 long, indexed)
SALARY	_____	(SS, 5.2 long, computed)
RAISE	_____	(SS, 6.2 long, computed)
NEW SAL	_____	(SS, 6.2 long, computed)

After the the field designator NAME is placed on the

Defining the fields is the first step in designing a DATAEASE form. Fields can be designated as either indexed or computed, also called "derived."

## PRINT STYLE

**PRINT STYLE SPECIFICATION**

Report Destination: ☐ If disk Output, Filename:  Allow Style modification at run-time: ☐

Now press DEFAULT VIEW to get default values for the remaining fields

Printer Name:

Pause after each page? ☐

**IF PRINTER NAME IS SPECIFIED ABOVE:**

**PAGE SIZE AND POSITION ON CARRIAGE (in inches)**  
 Length:  Width:  Starting position:

**MARGINS (in inches): SEE FIGURE ON LEFT**

1. Left	<input type="text"/>	2. Right	<input type="text"/>
3. Top to Header	<input type="text"/>	4. Header to Text	<input type="text"/>
5. Footer to Bottom	<input type="text"/>	6. Text to Footer	<input type="text"/>

**TYPE STYLE**

Character Per Inch:  Lines Per Inch:

Highlights: 1  2  3

F1  F2  F4  F5  F6  F9

DATAEASE's Print Style Specification menu.

**W**hen I began reviewing DATAEASE, I assumed that, as a Category 3 package, it would be powerful and easy to use. It does have a multitude of convenient features; you can, for example, enter commands and edit at the same time as you are defining or modifying forms, reports, or relationships. You can also easily add, alter, insert, or

delete fields anywhere on the screen and import several data formats.

However, I found that DATAEASE's strengths are counterbalanced by an awkwardness and rigidity that became increasingly noticeable as I used the package. Its most salient drawback is that it does not include a real procedural language but relies entirely on menus to perform the same tasks. You cannot bypass menus as you become more familiar with the package, and this awkwardness is intensified by the roundabout syntax you must use to define reports. These highs and lows make DATAEASE an uneven product.

## Creating the Form

In DATAEASE, the form you create to enter data is your file; you enter, edit, store, and view your data in the form. You must, therefore, begin your work by

designing a form. DATAEASE makes this process simple; you "paint" a blank screen to create any format you like. When you use the data in a transaction, you retrieve it with the form name; you don't need filenames in DATAEASE. Of course, each form represents only one view of the data, but you can get multiple views of your data with the report features, which create any view by culling fields from more than one form.

Since these forms represent the only possible views, files that result from a report definition are not directly accessible because they are not output as forms. To be viewed, these files must be imported and a form created for them.

Because the form stores records, the record structure must be defined and the records entered into the form. To get started on a form, you move to the Forms menu and choose the Define A Form option. You then give the form a name and a blank screen appears. In this and other such menus you have full use of the cursor keys and the Ins and Del keys. You can move the cursor to the margins with Ctrl and cursor key combinations. The function keys are also used; their functions are displayed at the bottom of the screen. DATAEASE's full use of the PC keyboard makes creating or editing a form easy.

Since you will enter data one record at a time, you can lay out the fields of a single record to facilitate data entry or editing. Typically, field names appear along the left margin followed by a line indicating the maximum length of the data for the field. For example, to designate a field as the Name field, you type it in, move the cursor out a few spaces, and press F10 to define that field. You are then prompted for a field name; pressing Enter allows the name to be accepted. A field type prompt appears next; here your choices are text, numeric string, number (integer, fixed point, or floating point), date, time, and dollar. The choices are displayed across the top of the screen. You are next prompted for the maximum length of

(Text continues following the Database Chart.)

## DATAEASE

Software Solutions  
 305 Bic Dr.  
 Milford, CT 06460  
 (203) 877-9268  
 List Price: \$600

Description: Relational

Requires: DOS 1.0, 192K RAM, two disk drives.

Records per File: 65,535

CIRCLE 739 ON READER SERVICE CARD



## Entry Editing Capabilities

None	Range Tests	Specific Values	Default Values	Table Lookup (To an Outside File)	Verify (Requires Data to Be Input Twice)
—	Yes	Yes	Yes	No	Programmable
—	Programmable	Programmable	Programmable	Programmable	Programmable
—	Yes	No	Yes	Yes	No
—	Programmable	Programmable	Programmable	Programmable	Programmable
—	Programmable	Programmable	Programmable	No	Programmable
—	Yes	Yes	Yes	Programmable	Programmable
—	Yes	Yes	Yes	No	Programmable



Entry Editing Capabilities (cont'd)			Adaptation to PC		
Required Field	Date Tests/Date Conversion	Other	ASCII Characters Only	Graphics Symbols	Color
Programmable	Format is checked as date is entered. Can be set to DD/MM/YY or MM/DD/YY during installation.	No	Yes	No	No
Programmable	Programmable	No	Yes	No	Yes
No	No	Computed fields	Yes	No	No
Programmable	Yes	No	Yes	Boxes around data groups	No
Programmable	Format is checked as date is entered. Can be set to DD/MM/YY, MM/DD/YY or YY/MM/DD during installation.	No	Yes	No	No
Programmable	Yes	Translations, input and output pattern checking.	Yes	Yes	Yes
Yes	Yes, dates can be used in all relevant math operations.	No	Yes	No	No

				User Interface	Files
DOS 2.x Subdirectories	Alternate Input Methods (mouse, etc.)	Files Across Multiple Drives	Function Keys		Method of Data dictionary or other means
No	No	No	No	Menus/prompting	Fields created via definition procedure using FILEDEF program
No	No	Yes	Yes	Choice of menus, natural language command line, or procedure interface entry	Specify type, length, and decimal places if numeric
No	No	No	Yes	Prompting	No
No	No	No	No	Uses menus, will prompt for field labels	Data dictionary
No	No	No	Yes	Menus/prompting	Fields created via definition procedure in Quick Gen
No	No	Yes	Yes	Visual/verbal	Name, type, length, default value, ranges, translations, input and output patterns, comments
No	No	Yes	Yes	Uses prompting, reverse video, split screens and cursor positioning. Menus used widely in conjunction with visual presentation of data	Data dictionary



## Files (cont'd)

Specification	Things You Can Specify				
Must files be built/modified only from data dictionary?	None	Field data	Tokens, aliases, or synonyms	Index data	Permissions/security
Yes, using FILEDEF program.	—	Alphanumeric, integer, long integer, and floating point.	No	Yes	Programmable
Files and data dictionary built simultaneously.	—	Programmable	Programmable	Programmable	Programmable
—	—	Name, type, length.	No	Yes	Yes
Yes, but data files can also be imported/exported.	—	Name, length, type, upper case only, decimal positions.	Overlapping fields are supported.	Up to 9 keys per record.	Programmable
Restart file must be saved with data file to allow later modification.	—	Name, alphanumeric, date, floating-point numeric, integer numeric, fixed-point numeric.	No	INDEX program will index files by key field plus up to 3 subfields.	Passwords enabled via Menu Gen program generator.
Files and data dictionary built simultaneously.	—	Programmable	Yes	Yes, but not in data definition stage.	Programmable
Yes	—	Alphanumeric, dollars, percent, date.	No	Yes, via Sequence Control (up to 3 keys) and Dynamic Key Sort (11 "candidate" fields can be set up but only 3 can be used at run-time).	Programmable

					<b>System</b>
					<b>Maximum No. Record Types per Database</b>
<b>Encryption</b>	<b>Relations</b>	<b>Validity tests</b>	<b>Error or prompting messages</b>	<b>Multiple views of database</b>	
No special feature, but FORMDEF forms are converted into run-time forms (compiled) before execution, making them unreadable by normal means.	Multiple file relations are possible; up to 6 standard files and 13 via programming.	Yes, will test entered data according to user-defined criteria.	Yes	Yes	6-file maximum is standard in reports; 13 files by user programming.
Programmable	Programmable	Programmable	Programmable	Yes, with different forms or reports.	1, others can be linked with programming.
No	Yes	Yes	Yes	Yes	Unlimited; 32 usable at one time.
No	Programmable	Programmable	Programmable	No, but can index up to 9 ways.	Unlimited, but only 16 can be open simultaneously.
No	Multiple file relations are possible.	Only data type is checked.	Error messages and help text	Yes, single files may be used in multiple applications.	2-file maximum in Quick Gen; 3-file maximum in Report Gen. Programming can overcome both limits.
Programmable	Programmable	Yes	Programmable	Yes, with different forms or reports.	1, others can be linked with programming.
No	Programmable	Yes	Yes	Yes	Multiple, dependent on programming.



Specifications					Error Handling
Maximum No. Fields per Record	Maximum Record Size	Maximum No. Records per File	Maximum No. Records per Database	Maximum Field Size	
100	1,024 bytes	999,999,999	Limited by disk space.	127 bytes	Field-by-field
50	2,048 bytes	32,767	32,767	255 bytes	Field-by-field on reporting and selective reprompting on data entry into forms and screens.
255	8,000 bytes	65,535	Limited by disk space.	255 bytes	Field-by-field
1,000	Limited by disk space.	16,777,216	16,777,216	255 bytes	Field-by-field is automatic; total and selective reprompting are programmable.
64	1,024 bytes	65,536	Limited by disk space.	64 bytes	Field-by-field
250	1,000 bytes	32,000	32,000	235 bytes	Field-by-field and selective reprompting
99	2,048 bytes	32,767 per "database volume"	3,200,000	80 bytes	Field-by-field

## Data Types and Maximum Sizes

Character	Numeric				Data
	Integer	Floating point	Money or dollars	Other numeric	
127 bytes	±29,999	±99,999,999,999.999 (stored in BCD format)	No	Long integer, ± 999,999,999	Yes
255 bytes	15 digits	14 digits	No	Fixed point, 15 digits.	No
255 bytes	14 digits	14 digits	14 digits	Fixed point, 14 digits.	Yes
255 bytes	15 digits	No	No	Computations are done to 5-decimal-place precision, then rounded to the precision of the target field.	Yes
64 bytes	12 digits	12 digits	No	Fixed point, 12 digits.	Yes
235 bytes	20 digits	No	20 digits; can be specified using input/output pattern.	Fixed point, 20 digits.	Yes
80 bytes	14 digits	No	14 digits	Percent	Yes



Types and Sizes (cont'd)		Demo Version			Data Importing
Time	Logical	Available?	Cost	Limitations	
No	No	Under development	\$10-\$20	User will not be able to output any data.	ASCII only—not well documented.
No	No	No	—	—	DIF, SDF or special formats using TRANSDB data translation feature.
Yes	Yes	No	—	—	DIF, dBASE II, comma-separated ASCII.
No	No	To dealers only	\$35	150-record limit	BASIC random format
No	No	Yes	Free	26-record limit	DIF, but import/export method not documented.
Yes, in reporting phase.	No	Yes	\$25	25 records per file, 500 bytes per record, small text and sort areas.	Import facility said to be available, but did not work. Reviewer wrote conversion routine in BASIC.
No	No	Yes	Free	Just demonstrates features.	DIF

Data Exporting	Advanced Features				
	Back-up-ability/ Copy Protection	Audit Trails		Data Restructuring	
		Pre/post imaging	Activity or transaction log	Technique (Inherent/ separate program)	Adding or changing indexes
ASCII, can include embedded characters such as double quotes and commas.	Internal COPY function can back up files and remove records marked for deletion. The INDEX (R)ecovery option will do its best to repair damaged files.	No	Transaction files can be developed by the user to keep "snapshots" of how data are manipulated during a database session.	Inherent	Yes, multiple indexes can exist for a single file. Old indexes can be deleted and new indexes created at any time.
No	Not copy protected.	No	No	Inherent	Yes
DIF, comma-separated ASCII.	Full back-up capabilities.	No	No	Inherent	Yes
BASIC random format	Program won't work unless it displays the registered owner's name and address on the first screen, which discourages passing out free copies to friends.	No	No	Separate restructure utility	Yes, separate rekey utility.
DIF	Not copy protected.	No	No	Inherent	Yes
Export facility said to be available, but did not work.	Not copy protected.	No	No	Inherent	Yes
DIF	Not copy protected.	No	No	Automatic reorganization of database files whenever revisions occur.	Yes, sort keys can be added/deleted/cloned as required.



Features (cont'd)		Report Generation			
Linked or Multiple Update of Indexes and Files	High-level Language &/or Product Interface	Capabilities			
		Sorting	Aggregates (min., max., count, avg., percent, etc.)	Arithmetic (#, /, +, -)	Parameter passing
Yes, via batch update.	Yes	No, ISAM files used.	Aggregates can be created by applying math and/or logic functions to the contents of memory variables. Can also do date calculations and remove decimal places.	Yes	No
Yes	No	Yes, on all fields.	Subtotals, totals, and others with programming.	Yes	No
Yes	No	Yes, on all fields.	Totals, subtotals, minimum, maximum, average, count.	Yes, in computed fields.	No
Programmable	No	Yes, but on 1 key only.	Programmable	Yes	No, but temporary files can be used.
Yes, via batch update.	Yes	No	Count, subtotal, total.	Yes	No
Programmable	No	No separate sort fields; can have concatenated sort key up to 235 characters long.	Subtotals, totals, count, average, and others with programming.	Yes	Yes
No	No	Yes. 3 sort fields for fixed-key sorts; 11 sort fields for dynamic-key sorts.	Total, average, minimum, maximum.	Yes	No

		Query Language			
Flexibility of output	Multifile access	Mass additions, deletions & updates	Load and unload	Execute stored scripts	Quality of output
Fairly good	Yes	No	Files can be loaded/unloaded via QUERY commands.	Yes, query strings can be saved to disk for later use.	Good; includes mailmerge function.
Fairly good	Yes	Yes	Yes	Yes, via procedural language.	Good
Constrained by its way of naming computed fields.	Yes	Yes	Yes	Yes	Fair
Great	Yes	No	No	Yes, via procedural language.	Good
Adequate	Yes	Yes, via updates.	Yes, via macro programming commands.	No	Good, but primary file record will be displayed only if there are matching secondary or secondary and tertiary records.
Good	Yes	Programmable	Yes	Yes, via procedural language.	Very good; METAFILE's text processor allows flexibility in report formatting.
Good	Yes	Programmable	Programmable	No	Good



Report Generation (cont'd)					Procedural Language
Query (cont'd)	Report Formatter/Generator	Screen Dumps	Other	Built-In Applications or Examples	
Other					
Index files can be created and saved via the query language.	Yes, part of the FORMDEF procedure.	Yes, via FILEPROC procedure or QUERY strings that use the PRINT command.	No	No	Yes, FORMDEF programming commands.
Query language capabilities are built into commands.	Yes	No	No	Yes	Yes
No	Yes	Yes	No	No	No
No	No	Yes	No	Mailing list sample	Yes
Concatenated fields and calculated fields.	Yes, via Report Gen, which creates executable report programs.	Yes, via Quick Gen applications or customized Report Gen programs.	No	No	Yes, <i>probase</i> macros.
No	Yes	No	No	Yes	Yes
No	Yes, output available in reports, lists, and menus created via Program Models option.	Yes	No	No	Yes, available via Program Models option.

Performance Measurements					
Time to Enter Standard Info.	Time to Execute Standard Task	Time to Perform Sort	Time to Extract Random Records	Size of Database Created	
				Number of records in employee file	Space compression
22 mintues, imported.	17 minutes, 30 seconds.	No sorting; uses Indexed Sequential Access Method files.	2 minutes, 47 seconds to extract 4 records with last name = Williams.	500	No
1 minute, 20 seconds, imported.	15 minutes, 20 seconds.	2 minutes, 18 seconds.	2 seconds	500	No
Limited by typing speed.	6 minutes, 52 seconds.	5 minutes, 20 seconds. Had to use report writer.	1 second	500	No
1½ hours to prepare, 2 hours to import and index.	3 hours to prepare, 41 minutes, 40 seconds to list.	No sorting; uses indexes exclusively.	1 second	500	No
Limited by typing speed.	6 minutes	No sorting; uses Indexed Sequential Access Method files.	8 seconds to extract 2 records with last name = Williams.	25	No
1 minute, 54 seconds using BASIC conversion program.	3 hours, 8 minutes.	1 minute, 9 seconds.	4 seconds	500	No
20 minutes	18 minutes	9 minutes, 30 seconds.	3 minutes to list 2 records with last name = DiMeara.	500	No



Performance Measurements (cont'd)					Hardware/
Size (cont'd)	Number & Size of Ancillary Files	Degradation with Additional Indexes	Time to Create a Standard Report to Screen	Time to Execute a Standard Report to Screen	Minimum Configuration Required
Variable length of fields					
No	Index, intermediate conversion and report form files.	Minimal	5 minutes	17 minutes, 50 seconds.	128K, 2 drives, DOS 1.1.
No	2 temporary files, 21,788 and 24,508 bytes.	Degrades sort time by approximately 40 percent.	Less than 1 minute.	1 minute, 18 seconds.	128K, 2 drives, DOS 1.1.
No	Any number of index files. Size is a function of index field.	Minimal	6 minutes, 52 seconds.	18 minutes, 14 seconds.	192K, 2 drives, DOS 1.0.
No	3 index files: 27,648, 25,600, and 11,264 bytes.	No	3 hours	41 minutes, 40 seconds.	128K, 2 drives, DOS 1.1.
No	6 ancillary files totaling 20K.	Minimal	10 minutes	6 minutes, 6 seconds.	128K, 2 drives, DOS 1.0.
No	3 files: 4,096, 8,192 and 8,192 bytes.	Degrades sort time by approximately 20 percent.	About 1 minute	4 minutes, 4 seconds.	128K, 2 drives, DOS 1.1.
Yes	One 3K index file	Minimal	40 minutes	25 minutes	256K, 2 drives, DOS 2.0.

Software		Subjective Evaluations			
Configuration Used in Testing	Documentation	Program Robustness	Flexibility/Ease of Use	Would You Buy This One?	Would You Accept It as a Gift?
320K, 2 drives, DOS 2.0.	Good-presentation of the less-complicated features, but tends to lose clarity when covering programming topics.	Could be better. A little too eager to hand the user back to the operating system.	Quite flexible, but quirky to use.	Probably not. Has some powerful features, but creating report form was too cumbersome.	No
2 drives, 320K, DOS 2.0; also 27MB hard disk, 320K, DOS 2.0.	Good	Good	Good	Yes, <i>MANAGER</i> offers many good features for little money.	Yes
512K, AST board with RAMdisk.	Very good and clear. More examples would have been helpful.	Not very robust. It crashes easily.	Easy to use because everything is done in response to prompts; difficult because sometimes language of prompts is not what you expect.	No, but some people would learn to use and love it.	No
256K, 2 drives, DOS 2.1.	Excellent	Excellent	Powerful, but procedural language is flawed.	Yes, for small business applications.	Yes
320K, 2 drives, DOS 2.0.	Covers many of the issues the beginner would be interested in learning, in a fairly easy-to-follow manner.	Adequate	Good	No, but is a good guide for a beginner and provides a lot of programming power.	Yes
320K, DOS 2.0 and 2 drives; also 27MB hard disk, 320K, DOS 2.0.	Fair	Good	Good	No, too expensive.	Yes
320K, 2 drives, DOS 2.0.	Quite good, even though written in textbook form.	Quite good	Good, but performance is slow on a floppy-disk-based system.	No	Maybe, if I were given an XT to run it on.



(DATAEASE continued)

field. For the Name field, you can enter 24. You can further refine your field definitions by designating your fields as index keys, for range checking, or as derived.

The Name field would be a good candidate for indexing since you often need to select records based on this field. The range check is a nice DATAEASE feature that checks data entered against an upper and a lower limit, rejecting any that doesn't fit. A Derived field is a powerful way to perform a number of tasks; the data for this type of field can either be computed with some formula, looked up on another form, be a sequenced number or string of letters, or be a default constant number or string. For example, you could add a field called Raise and define it as a Derived field computed with a formula such as "SALARY" \* 0.25.

## Joins

One of the major tests of whether or not a database manager is relational is its ability to perform "joins," that is, to combine fields from two different files into a new file. DATAEASE can perform this task, which it refers to as Lookups. Looking up a field located in another form is a two-step process; you must specify how to look up the field under the Derived field option and then must define the relationship between the forms (files). The first part is easy; the syntax is LOOKUP formname fieldname. Relationships are defined on another menu. The Relationship menu asks you to identify the two forms involved and then to define fields from each form that are identical, such as Name or Employee Number. That's all there is to it. If you had another form, Employee Master Info, with your employees' Number, Name, Address, and Department on it, you could access those fields when entering data by deriving those fields with the LOOKUP command.

## Data Entry and Update

Now, to enter some data on your form, you move to a new menu that both displays the forms already defined and

prompts you to select one, because the data you enter will be identified with this form name. The screen then displays the blank form with field names and lines indicating the maximum length of the data. The cursor rests on the first field, Name. You then type someone's name, hit the Enter key, and the cursor moves to the next blank field. You type in Salary, hit Enter, and the Raise field is computed



Range check is a nice DATAEASE feature that checks data entered against an upper and a lower limit, rejecting any that doesn't fit.

for you. The Address field, if you looked it up, would also appear. You then enter this record and move to the next one.

This same menu permits any record to be altered or updated. If a teacher, for example, had designed a student form with fields for the grades from five tests, the fields would only be filled in after the tests were corrected and graded. Then a computed field, Final Grade, could aver-

age the results to complete the process.

## Query Language and Reports

DATAEASE combines a report writer, query language, and data manipulation language on one menu. The menu's options are to run a one-time-only report, a query, using a special print style for queries; define a new report; run an existing report; and then view, modify or delete an existing report. DATAEASE is designed to expedite the production of reports from the database. But while most systems permit simple queries to be ad hoc, with DATAEASE you must treat even a simple query like a big production, as if it were a full report—that is, you must define the print style, define the query, define the format, and then run it.

To give you the flavor of this procedure, I'll run through a report definition with the Salary Information Form. As usual, the menu displays numbered choices from which to select; you hit 3 to select the Define A New Report option and are immediately prompted to name it. (Let's call it Salary Info.) The system then asks, "Do you want to define a data-entry form for the report (y/n)?" This form would request various information to be included at run time. Instead, move on to define your query. You select the data to be included in the report, specify computations, prescribe Lookups, and organize the data. DATAEASE structures each part of this process by displaying the options available and prompting you to enter the number of the selected option. The structuring is rigid, but DATAEASE is somewhat forgiving of inadvertent mishaps. You can move into an Edit mode at any time to fix things, again with all the special PC keys functioning. But when moving in and out of the Edit mode, if you direct the cursor backwards to edit a field, DATAEASE may still be prompting you about the latest field you completed. This limitation quickly becomes frustrating.

For the Salary Info report, you are first prompted to select among the forms you have created, which are displayed by

number across the top of the screen. You select the Salary Info form. You are next prompted for criteria with which to select records from the form, which you do by comparing one or more of the fields to possible values for those fields, as in:

```
for formname with SALARY
>=30,000
and SEX = FEMALE.
```

The data entry form mentioned in the criteria statement can be included in this selection process by comparing one of the fields to data entered at run time. For example, if you requested Minimum Salary with the data entry form, you could use this comparison:

```
with SALARY >= data entry
Minimum Salary.
```

### Computed Field Problems

Once you have completed record selection, you define the fields to be included in the report; the fields are normally selected from the form. This is where I had an unpleasant surprise. I found that the Derived fields on the Salary Info form are blank on the report! The Derived fields, which get their data by looking them up on another form or by computing them, are



Most systems permit simple queries to be ad hoc; with DATAEASE you must treat even a simple query as if it were a full report.

not used by the report generator. Bad news! You must redefine these fields to use them in the report. Unfortunately, the report definition procedure is much more awkward than the straightforward one for

forms definition. For example, to redefine the computed field Raise for the report form, you start by typing in the Salary field. (Raise was defined in the input form as 25 percent of salary.) You next get the prompt "Select arithmetic symbol," with a list of numbered options. For Raise, you choose option 1, an asterisk, and then type 0.25, a ridiculously complicated procedure. You are then prompted for any statistical summary information you want to include.

DATAEASE provides some simple statistical functions such as sum, count, maximum, minimum, and average; thus a sum of the raises could be reported by the additional command ITEM SUM (selected from the given menu, of course). Finally, you are prompted to supply appropriate punctuation, indicating whether or not the current field is the last field in the report. I resented having to go to the trouble of choosing a menu number simply to insert a semicolon or a period.

I have a further criticism of DATAEASE's handling of computed fields. In most other database managers, computed fields can be used as variables in other computed fields. For example, the Raise field, which I defined as 25 percent of the Salary field, could be used to define the New Salary field as SALARY + RAISE. Unfortunately, DATAEASE will not permit this, so New Salary would have to be defined as SALARY + (SALARY \* 0.25). This limitation could be cumbersome in such important applications as calculating payroll, in which all sorts of deductions must be made.

### How Slow Does It Go?

Floppy disks are just too slow for serious database management. It took over 2 hours to import to DATAEASE the data for the tests. With a hard disk, the process was about ten times faster. A RAMdisk was faster still. Joins really slow the processing of records, but joins are what relational database managers are all about.

Creating an employee history report brought home to me the inherent awk-

wardness of DATAEASE's data manipulation language. There was really no way to compare the contents of two records or to calculate the difference between two records that have the same employee num-



In an attempt to make DATAEASE simple for a new user, Software Solutions has made its processes too rigid for my taste.

ber. DATAEASE requires unique index keys for each record.

DATAEASE has utilities that can import data into a form from other software packages, transfer data between forms, and move forms or reports to other database packages. On other menus are procedures for backing up the databases and recovering from crashes. A Database Status report is a kind of data dictionary, listing all the forms, indexes, reports, and so on in the database.

### Conclusions

In an attempt to make DATAEASE simple for a new user, Software Solutions has made its processes too rigid for my taste. It can do everything that a database manager is supposed to do, but I do not like the way it performs these tasks.

I did not find DATAEASE a hospitable environment in which to work. The syntax is confusing and the data manipulation process rigid. Although I worked with DATAEASE for a full 2 weeks, I didn't feel confident with its procedures. I was never certain what to expect as output. Even considering its several strong points, on balance DATAEASE suffers by comparison with similarly priced systems.

—James Perotti



# THE SENSIBLE SOLUTION: A Tower of Strength

DINOSAUR DONUTS, Inc. --- Personnel System

---

EMPLOYEE RECORDS

-----

LAST NAME: Hannotte      FIRST NAME: Joan      EMPLOYEE NUMBER: 138138  
 ADDRESS : 318 East 6th Street, Suite 200  
 CITY : New York      STATE: NY ZIP: 10003

---

DEPARTMENT RECORDS

-----

DATE: 840101      DEPT. NO.: 200      COST CENTER: 10000      EMPLOYEE NUMBER: 138138  
 DEPARTMENT NAME: Data Processing

---

SALARY RECORDS

-----

DATE: 840101      SALARY: 42500.00      EMPLOYEE NUMBER: 138138

---

Next Previous Save record Remove record Clear fields Jump screen  
 Quit screen Trace ?(Help)

THE SENSIBLE SOLUTION screen showing data from each of the three files.

**T**HE SENSIBLE SOLUTION is one of those packages that tries to be all things to all people and very nearly succeeds. Although not especially sophisticated in all areas, it still gives you more for your money than most database managers. For small businesses, the SENSIBLE SOLUTION may be the all-purpose program of choice.

In THE SENSIBLE SOLUTION, you create an application with three simple steps: (1) define the files you'll use, and the fields within them; (2) define the layouts of the screens and/or reports you want; (3) write a program in THE SENSIBLE SOLUTION language to process the data.

The process is simpler than it sounds.

## THE SENSIBLE SOLUTION

O'Hanlon Computer Systems  
 11058 Main St., #225  
 Bellevue, WA 98004  
 (206) 454-2261

List Price: \$695

Description: Linked indexed files.

Requires: 128K RAM, two disk drives, DOS 1.1.

Records Per File: 16,777,216

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THE SENSIBLE SOLUTION helps you at each step of the way by filling the screen with useful information, prompting for what it needs next, and making available a consistent array of pull-down and pop-up menus that remind you of all the choices available.

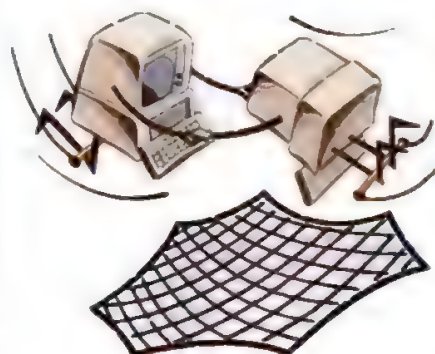
## A Sample Personnel System

To evaluate THE SENSIBLE SOLUTION, I set up a PC test application with a small number of functions. It included a personnel file with one record per employee, a historical department file that recorded employee transfers, and a historical salary file that recorded raises.

As I discovered when I began to work, THE SENSIBLE SOLUTION disks won't, at first, handle more than 150 records. This temporary limitation is part of a clever program protection scheme. To "unlock" the full capacity of the system, you must call up O'Hanlon Computer Systems and agree on how your name and address should appear on the first screen whenever you use the system. You key it in. You are then given a password, which you also key in. You need only enter this information once. The name and address go with only one password, but you'll never guess the

algorithm, so you can't patch the program to change what's going to appear on the first screen without going back to the 150-record limitation. The bottom line is that you can give THE SENSIBLE SOLUTION to your friends, but only if you're willing to have your name and address appear on the copies they give to their friends.

After unlocking the system, you can get down to business. The first decision you'll need to make when designing files in THE SENSIBLE SOLUTION is which fields will be used to make searches. You can have up to nine such key fields per file, and when you tell THE SENSIBLE SOLUTION to save a record, it updates all associated indexes. Furthermore, all keys in a record can be changed before storing a record back on disk. THE SENSIBLE SOLUTION will delete the old keys and



insert the new without making you think twice about it.

One of the few facilities that THE SENSIBLE SOLUTION lacks is the ability to sort extracted data prior to printing a report. This limitation means that any sequence in which you'll ever need to see your data must be defined from the start as a key field.

You may find this lack of a SORT utility particularly irksome if you expect to see your data arranged in complementary ways (for example, by last name within

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Company \_\_\_\_\_

Address \_\_\_\_\_

City, State & Zip \_\_\_\_\_

Phone Number ( ) \_\_\_\_\_

My computer is \_\_\_\_\_

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San Diego, CA 92127  
Attn: Marketing Communications

11304 PM8



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FOR IMMEDIATE ORDERS ONLY

Prices and availability subject to change without notice. No CODs. Send cashier's check or money order. All other checks will delay shipping three weeks. MasterCard and Visa accepted (include telephone number). Add \$12.00 for handling and shipping UPS ground within the continental U.S. California residents add 6%. Approval needed on all returns. 0-10% restocking charge on all returned merchandise.

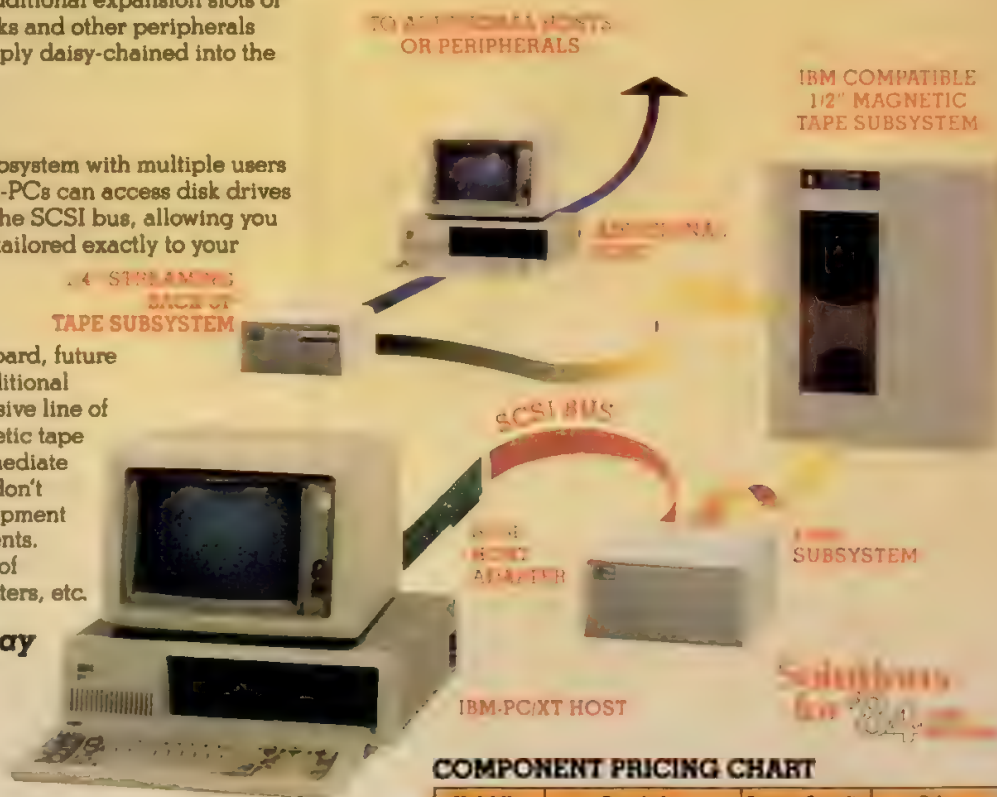


## Successful and easy installation required

Supplied with each component are the required cables, complete software driver package and user language instructions. The user manual will have you quickly running and appreciating the many features of the subsystems, such as quick automatic boot load of the operating system from the IDT disk subsystem.

## Satisfaction guaranteed

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RD 2047M	Master Disk Subsystem	47MB	3150.00
RD 2126M	Master Disk Subsystem	126MB	6840.00
RD 2011S	Slave Disk Drive	11MB	1560.00
RD 2023S	Slave Disk Drive	23MB	2130.00
RD 2035S	Slave Disk Drive	35MB	2530.00
RD 2047S	Slave Disk Drive	47MB	2730.00
RD 2126S	Slave Disk Drive	126MB	6290.00
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## Ordering

### Example:

If your need is a 23MB Subsystem, your order would consist of the following components:  
**1-RD 2023M @ \$2550.00 + 1-RD 8111H/A @ \$510.00 + Shipping & Handling @ \$12.00 = A Total Order of \$3072.00 + tax (if applicable)**

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city for one report, and by city within last name for another). Since *THE SENSIBLE SOLUTION* requires key fields to be continuous while allowing them to overlap one another, you might have to duplicate the shorter of the two fields, say CITY, and define part of your record as

```
CITY.1  
LAST.NAME  
CITY.2
```

You would define the first two fields as one key, and the second two as another.


In the PC test application, the employee file was indexed by last name and separately by employee number. The department file was indexed by employee number concatenated with transfer date. Since there would probably be only a few records for each employee, I decided it was acceptable to index generically into the department file using the employee number with a zero date, and scan sequentially to find the most recent transfer. Similarly, the salary file was indexed by employee number concatenated with date of salary change.

Another price of not having a SORT utility is that you may have to replicate fields that logically belong in separate files to maintain indexes in the appropriate order. You may keep your department file in department order and your employee file in employee number order, but if you ever expect to see a list of employees by department, you'll just have to keep the department number in each employee record as well as the employee number in the department record.

The first step is to define the files and the fields in the Data Dictionary Maintenance program. All field names begin with an abbreviation of the file to which they belong. This abbreviation is necessary because field names must be unique across all applications in *THE SENSIBLE SOLUTION*. The second component of the name is the number of the field within the record. *THE SENSIBLE SOLUTION* asks you the length of each field but not where it begins in the record. Most dictio-

naries would assume that each field begins where the previous one left off, but not *THE SENSIBLE SOLUTION*. It requires that fields reside in the record in alphabetical order by name. This means that if you want to control the order of your fields, you must do so by coding the field sequence as part of the field name.

Next, I had to initialize the files. In this process, the program calculates (or recalculates) all of the offsets in the dictionary for the file in question and writes out a zero-length data file (with extension .MS)



To get THE  
SENSIBLE  
SOLUTION to take  
my files, I wrote  
a short BASIC  
program.

and a structured but empty index file (extension .KS). Since I was introducing data from outside *THE SENSIBLE SOLUTION*, I deleted the .MS files and got ready to rename my test files.

At this point I had to deal with the fact that some of the files distributed as part of the PC test were not laid out exactly as I had defined in the dictionary, that is, with the separate pieces of the key fields (the employee number and date) concatenated. It is possible to restructure databases using *THE SENSIBLE SOLUTION*, but only by generating the indexes twice. I decided to use a homier restructuring program instead—a text editor (KEDIT in this instance) that simply moved columns of data around to my liking. *THE SENSIBLE SOLUTION* never knew the difference.

To get *THE SENSIBLE SOLUTION* to take possession of my files, I then had to write a short BASIC program. *THE SENSIBLE SOLUTION* asks that files be in BASIC random format (fixed-length

records with no CR/LF separators) and that the record length be a multiple of 128. This second requirement is a great space waster for files with small records, but it makes record locking in multiple-user systems simpler.

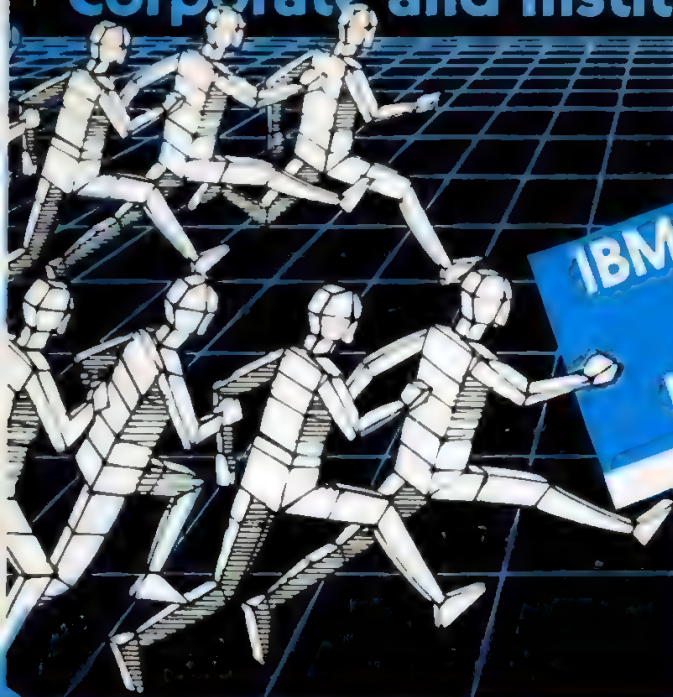
The only step left was to create the index files. *THE SENSIBLE SOLUTION* not only allows you to completely restructure data files and re-create the associated index files, but also to create the index files from scratch using a utility called REKEY. It is a slow process.

It was then time to develop an application using *THE SENSIBLE SOLUTION*. The first assignment was to scan the salary history file and calculate the amount and percent of salary changes. To keep things simple, these figures would be written into empty fields in the file. Although such a program doesn't really require a screen, I thought it would be nice to display the current employee number to convince myself that the program was actually accomplishing something. *THE SENSIBLE SOLUTION* Screen Painting program does exactly what its name suggests. You fill in a sample screen with whatever constants you like (company name headings, field names, comment lines), and then say where each field will be displayed. The program doesn't merely create screens and report formats, however. It also sees to it that a complete set of routines to manage these displays will be available to your program. The displays become a real-time window into your application. When your program changes a field that you have painted on the display, the rest of the screen reflects the change instantly. When you read a record, all of its fields named to the Screen Painter are projected on the screen. Also, if you hit the Esc key while a program is executing, it brings up a menu that allows you to navigate the displayed file in either direction, to delete the displayed record, to add a new record, or to blank out the fields in the screen so that new data can be entered.

After defining the screen, you can invoke the Program Generator, which will



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get you off to a good start in writing your first *SENSIBLE SOLUTION* program. It prepares for you a simple program allowing data entry, file browsing, and record purging. You can then take this program and invoke the Source Code Editor.

This Editor is surely the most novel program of *THE SENSIBLE SOLUTION* set. Although you can insert, change, and delete lines as in any other editor, this one leads you through each step of the way. If you add a line, for instance, it prompts for a label. Then it prompts for a verb. You need only type the letter capitalized in each displayed verb name. If you type *i* for IF, it prompts you for the condition to be tested. You can type a number from 1 to 6 to indicate a choice of quantitative relations, the letter *d* for DUPLICATE KEY CHECK, or *r* for RECORD NOT ACTIVE CHECK. If you typed a number, it prompts you for the name of the field to be tested, the expression it is to be compared against, whether you want to use a GOTO or GOSUB statement, and what the target label for this statement is. Since you make most of these choices by pressing a single key, with the Source Code Editor, you find yourself generating page after page of syntactically pure code in minutes. After keying in the program, you then "compile" it.

When I finished scanning the salary history file and had calculated the salary changes, the next step was to produce a printed salary roster by department. Because of the way I laid out the files, I needed to sort the report by employee name within department. But *THE SENSIBLE SOLUTION* doesn't have an auxiliary SORT facility. Grrr. I settled for an alphabetical list by employee last name, showing most recent department and most recent salary. The logic consisted merely of reading through the entire employee file, and for each employee number scanning the related history files for the latest information.

The report I generated was designed using the SCREEN PAINTER utility, which actually works in two modes. In the

first mode, you paint a screen exactly the way you want it to appear. In the second mode, you design individual lines for a report, each of which can be as long as your printer can handle. You write down the line numbers, because you'll need them later. For example, line 1 might be your company name, line 2 the report name, lines 3 through 5 field headers, and line 6 a detail line. When you get into the Source Program Editor, whenever you want to print one of these lines, you simply supply the line number as the operand



## Functionally, THE SENSIBLE SOLUTION towers over much of the competition.

of the PRINT command. Of course, you can print blank lines or lines defined within the program. But it helps somehow to keep the report design process separate. In general, you'll print detail lines repeatedly, and header lines at the beginning of the report and at page breaks. With a little programming effort, you can get totals and subtotals as well.

I should mention that although *THE SENSIBLE SOLUTION* has a powerful input editing mask facility, its output editing leaves something to be desired. You can't specify that commas should separate each group of three digits, for example, and instead of a floating dollar sign you'll find your dollar amount floating to the left.

Finally, I wrote the program to update all three files. Although the program UPDATE was written in about one-twentieth the time it would have taken using mainframe programming tools, it wasn't quite as simple as the first two jobs. For one thing, I had to manipulate records from three different files on the same

screen. Also much more of the input/output function had to be explicit rather than implied.

The resulting program is not as fool-proof as an update program should be. It allows the user to browse through three files independently and add, change, and delete records from all three at will—without checking the validity of the data in any way.

### Summary

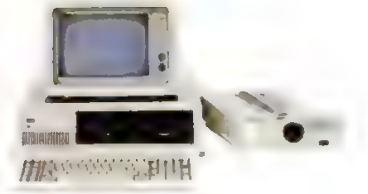
*THE SENSIBLE SOLUTION* is not a perfect package. On a floppy disk system it is slow and requires much swapping of disks. Screen painting is lugubrious, with a hypnotic large cursor fluttering through all points on the screen in a whimsical way. It needs a SORT utility. Its syntax for distinguishing data types is unusual: parentheses surround field names, angle brackets surround numeric constants, and square brackets surround character constants. Its support for arrays is hopelessly cryptic. It supports date fields but keeps them in an unusual format. You can transfer control to another program, but not return to the first. Perhaps most serious is its lack of support for temporary local variables.

Functionally, however, *THE SENSIBLE SOLUTION* towers over much of the competition. Its documentation is uniformly excellent and doesn't even misuse the word *relational*. An included mailing list application helps speed the learning process. Nary a single bug crawls out of its shining armor. A package like this might even give you the excuse you've been looking for to buy a hard disk.

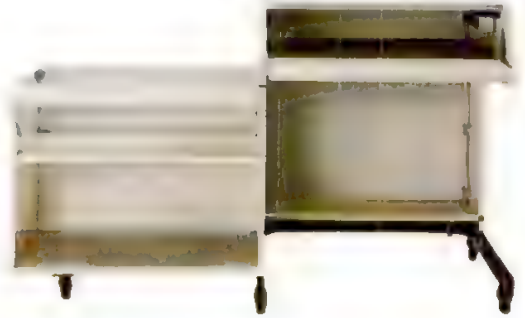
In addition to the \$695 *THE SENSIBLE SOLUTION* language package, O'Hanlon Computer Systems also sells canned business applications for \$400 to \$750. These are available by themselves, but you'll also need at least *THE SENSIBLE SOLUTION* run-time package that sells for \$200. O'Hanlon's upgrade policy is generous, and you can get lots of telephone help with a moderately priced service contract. —Dean Hannotte



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# and another



# and

# another.



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# probase: Exploring Under the Hood

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 EMPLOYEE NUMBER: 194067  
 ADDRESS: 410 Market St Shreveport LA  
 ZIP CODE: 71101

START DATE/DATE OF CHANGE	SALARY	PERCENT INCREASE	AMOUNT OF CHANGE
/ / Starting Pay	25800.00	0.00	.00
10/18/82	20005.40	16.30	4205.40

Part of a *probase* report showing amount and percentage of salary increase for Stephano DiMeara.

The *probase* database manager attempts to attract both the user who wants program generators to do all the work and the skilled programmer who wants the more creative environment of a custom programming language.

At its first level, *probase* features three automatic program generators capable of producing the code to create data input, update, retrieval, and reporting: Quick Gen, Report Gen, and Menu Gen. At the second level, *probase* provides the more sophisticated user with macro instructions and special instruction tables with which to develop customized database applications systems.

To create a database file with *probase*, you must first use the Quick Gen program generator. Many database development systems provide a wide range of menus from which to select options; *probase* ini-

## PROBASE

probase Group, Inc.  
 7316 Artesia Blvd.  
 Redondo Beach, CA 90278  
 (415) 638-1206

List Price: *probase*, \$300; *probase* plus generator modules, \$650.

Description: Relational

Requires: DOS 1.0, 128K RAM, two disk drives.

Records per File: 65, 536

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tially displays only the prompt "Command?" at the top left-hand corner of the screen.

In response to this prompt you are expected to type in appropriate two-letter commands such as DD (disk directory), CS (clear system), and RC (return control to the operating system). When you enter commands, *probase* usually prompts you for further information or gives you a last chance to change your mind; for example, the command CS (clear system) invokes the prompt "Clear System Y/N?"

You invoke Quick Gen by entering QG at the Command? prompt. The Quick Gen logo appears on the screen, and you are asked if you want to begin developing a program by pressing B or if you want to see an explanation of the options available with Quick Gen.

If you press B, Quick Gen asks if you want to modify an existing application. You cannot always go back and modify a Quick Gen program, unlike a BASIC or Pascal program saved on disk. For every file created and saved you must also save a special "restart" file that contains information on the structure of the program file it is saved with. The restart file must be present when you attempt to modify an application. If you don't save a restart file the first time around, you can change a Quick Gen program only by learning *probase's* macro language and metaphorical-

ly lifting the hood on an application to make changes.

## Creating a File

When you create a new file, you must name it and indicate on which disk drive you want to save it. The program asks, Do You Want To Use Two Files In This Procedure? Automatically, you can link single files into two-file applications. Using the available programming facilities, you can go beyond the two-file limit if an application demands it.

To begin designing the entry form for a database, you must decide how many fields you will need for your application and what types of fields they will be. The more field types a system offers, the easier it is to create truly useful databases, because fewer constraints are placed on how the end product will look and perform. *probase* offers alphanumeric, integer numeric, fixed-point numeric, floating-point numeric and date fields.

After you have entered the relevant parameters, *probase* starts to look a little less cryptic. A main Quick Gen menu appears, and selecting option 1 allows you to create a screen format for the display of data. You paint the screen with field labels in the same way you type text into a word processing document, so you can easily mirror the format of a printed paper form you already use. If you need more than one screen for an application (if you have too many fields to fit on one screen, or if you just want to separate fields for ease of viewing), Quick Gen can handle up to two screens of labels and headings.

Before you can position fields on the screen next to the explanatory labels, you must return to the main menu by pressing the F1 key and entering the number 3 when prompted,

1=Position Labels 2=Modify Labels 3=Main Menu  
 Enter 1-3[ ]

Through the main menu you create a screen display file that will eventually be



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saved to disk with the extension CRT. Now you can go ahead and create data fields. Press 2, tell Quick Gen that you want to add or delete a field to the primary file or secondary file (if there is one), and enter the field name and field type. Screen prompts such as Allow Keyboard Update? Allow Data File Search on this Field? and Enter Display Length let you choose options by typing Y or N in the boxes provided.

In lieu of user input, Quick Gen provides default values for each entry. The system knows that date fields will always have to be displayed in the usual mm/dd/yy form and therefore does not make you fool around with format parameters. To end a field definition and ready the entry screen for a new field, you enter E in the bottom box.

### Importing Files

Linking files together to retrieve specific information is easy to do with *probase*, as with most databases. However, unless you are dealing with large databases, it's also fairly easy to do the same thing with paper records and filing cabinets. When you start trying to perform more sophisticated tasks, though, the talents or shortcomings of relational databases become obvious.

The first task I tried to complete with *probase* was importing data from three record files into "skeleton" files that I created with Quick Gen. *Probase* features a data import/export facility, although the conversion procedure is not documented. The program used is called CONVERT.EXE, and it occupies about 36K on the *probase* designer disk.

According to the on-screen instructions, the CONVERT program will import DIF and *dBASE II* files into and export DIF and *dBASE II* files from *probase*. However, my attempts to load .SDF and .SEQ files elicited the error message Can't Open Input File.

A spokesman at Data Technology Industries knew of no apparent reason why the conversion procedure did not

operate correctly. DTI intends to fully document the CONVERT.EXE program in the manual's next printing.

Using Quick Gen, I created equivalents of the files that I would need to input the data, a fairly straightforward task that took about 20 minutes to complete. *probase* does not allow you to use the same field name in separate files that will be linked, so you may have to be creative when you start defining field names.

Once you have created all the field names necessary for a file, the main Quick Gen menu lets you make some decisions about how the end product will operate. For example, option 7, Specify Data Entry Sequence, lets you specify the sequence in



*probase* attempts to attract both the user who wants program generators to do all the work and the skilled programmer.

which users will be allowed to enter data. If you don't choose to alter the data entry sequence, Quick Gen presumes that you want data to be input according to the order in which you originally defined and created the data fields. Therefore, you must take care that the data entry sequence is not disturbed when you make changes to the number or types of fields in a file.

Once you have created an operational database, any changes to the size and number of fields in that file will erase its contents. It pays to design a file carefully and see how it works with dummy data before you commit any real resources to it. Once you are happy with the way your file looks, you return to the Command? prompt.

If you type EX (for execute), *probase* asks for the name of the application you wish to run and the disk drive on which it can be found. Once you have supplied the correct data, *probase* will display the screen you created with Quick Gen. Along the bottom of the display is a standard *probase* menu that allows you to read all records sequentially, read specific records according to a combination of conditions, add new records to the primary file, or add new records to a secondary file.

Selecting the Add Primary option from this menu updates the menu display so you can move from a completed record to a new blank record, move back to the previously entered record, cancel updates of the current record, delete primary and/or secondary records, or print the display.

### An Index of a Sort

I entered data into my imported files and then decided to order the first file by last name and the second file by employee number. On reading the documentation I was surprised to find that *probase* only provides for indexing a file as opposed to actually sorting.

When you sort a file, its contents are physically shuffled according to a specific key or combination of keys. On the other hand, when you index a file its contents remain in the same order, and a totally separate index file—containing information on the order in which data should be stored or retrieved—is created and saved to disk. Data can be found more quickly in a sorted file, because records are stored in a logically sequential order. An ideal database would, of course, provide both indexing and sorting and let you choose.

To index a *probase* file, you must

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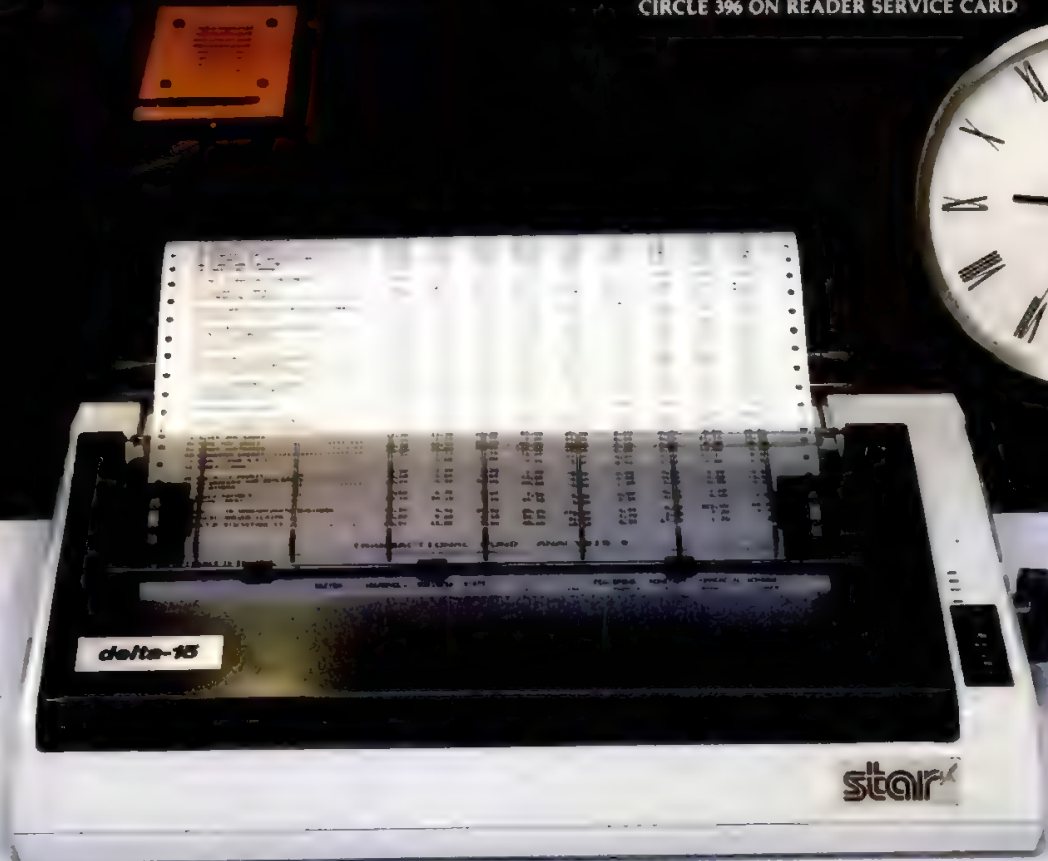
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return to the Command? prompt and type RC to return control to the operating system. Once the A> prompt appears, you type the command INSURE to activate the indexing program. You must supply the name of the file to be indexed, the drive on which it is stored, and the drive on which you want the new index file to be saved (it need not be saved on the same disk as the database file). Next, you must enter the key index field and any subindex fields (up to three subindexes).

You have no direct control over the manner in which files are indexed; *probase* simply goes ahead and places records in ascending alphabetical or numeric (ASCII) order on the basis of the first 16 characters in a field. At times you might want to index file contents in descending order, but most people can probably live with the *probase* approach.

Having indexed my two files, I created a third file that would contain mathematical computations. Option 6 on the main Quick Gen menu, Define/modify calculations, allows you to mathematically manipulate the contents of one or more fields to produce a completely new result. Computations can be carried out between fields or between fields and numbers.

### Cumbersome Calculations

I arranged the new file so that I'd only have to enter data in five fields, called Employee Number, Present Salary, Date of Change, and Percent of Increase. Two fields, Amount of Increase and New Salary, would be calculated automatically. The formulas are set up similar to calculations on a spreadsheet.

To obtain the Amount of Increase field I subtracted Present Salary from New Salary, but I immediately found that this approach didn't work too well. If I changed the value of the Present Salary, the Amount Increase field always seemed to reflect a *previous* change instead of the change just made. Presumably, some of the internal variables were not being set to zero correctly. When I tried some other alternatives, *probase* began to object; it

would either become locked into a loop or return me to the DOS prompt. The problem was that I was inadvertently trying to divide by zero.

I adopted the following cumbersome alternative: Amount of Increase = New Salary - (Present Salary - Present Salary + Present Salary). This seemed to do the trick. To generate the New Salary amount, I used the formula: New Salary = ((Present Salary/100)\*Percent Increase) + Present Salary.

*Probase's* computational abilities with-



Before you do any work within Report Gen, make sure you have created all the indexes for the files you are about to use—or you could be in for some surprises when you try to print out.

in Quick Gen are limited to addition, subtraction, multiplication, and division. These suffice for many simple applications, but the powers of logical operators such as equal to, greater than, and not equal to, would be useful. Unfortunately, you can only apply logical tests when using the Report Gen program to selectively extract data from files.

Report Gen allows you to design output forms that use data from up to three *probase* files. Additional files can be included if you use the *probase* macro language.

Before you do any work within Report Gen, you must make sure that you have created all the you will need indexes for the individual files you are about to use—otherwise you could be in for some

unpleasant surprises when you try to print out information. Records could appear in the incorrect sequence or, with larger databases, it could take ages for anything to happen. At worst, nothing but a lot of disk gnashing will happen.

Report Gen allows you to link primary and secondary files in a one-to-one, many-to-one, or one-to-many relationship. A third file, if used, can be linked to either the primary file or the secondary file as well, but it can have only a one-to-one or a many-to-one relationship with either file.

Data from primary file fields can be placed anywhere in a ten-line deep area starting from the top of the screen. Text labels can be included next to where the field data will appear. When there are multiple secondary records for each primary file record, the secondary information is relegated to the special 5-line deep printout area so that there will be no conflict between fields as they print out one below another. However, if there is only one secondary record for each primary record, you can mix secondary file fields with the primary fields. Fields from the third file can be displayed in the primary data area only if there are no multiple records in that file.

Report Gen clearly has limitations. You cannot develop an output form that contains primary record data, multiple records from a secondary file and multiple records from a tertiary file. The reports I created with my test data produced the expected results, but when you are designing an application in Quick Gen or Report Gen you must be aware that if you create a two-file application, the primary file records will be displayed only if there is a matching secondary or tertiary file record. Likewise, with a three-file application, primary file records will only be listed if there are both matching secondary and tertiary records. I occasionally had to resort to *probase's* macro language in order to get things to look just right.

Report Gen also provides the means to set up record-selection criteria at report-



generation time. For each report you can use up to six logical conditions, which can be fixed or which you can set at runtime via user prompts. Six logical tests are available (equal to, not equal to, less than, greater than, less than or equal to, and greater than or equal to), and conditions must be true for the required records to be printed.

### Menus for Users

After you're gone to the trouble of setting up all the Quick Gen and Report Gen applications, it would be unfortunate if you still had to type Ex (for execute) or some other *probase* command every time you wanted to enter or retrieve data. With the third program generator, Menu Gen, you can create a numbered menu screen that will automatically find files depending on user selections. A Menu Gen program can be automatically loaded if you save it under the name STARTUP on the *probase* system disk in the A: drive. Passwords can be used on applications that you want to protect.

If you wish to make major modifications to a Quick Gen or Report Gen application or create a *probase* application from scratch, you must use *probase*'s special macro language. There are three main programming tools for the *probase* programmer: the Procedure Table, Calculate Set, and Select Parameters Set.

The Procedure Table contains the main macro instructions, and although the format may seem a little strange, there are obvious similarities to code written in the BASIC and Pascal languages. The macro instructions are written sequentially, and unless the program encounters special JUMP ON CONDITION statements or calls to the Calculate Parameters and Select Parameters sets are encountered, it performs the instructions sequentially.

Among the macro instructions a *probase* programmer can use is the S command, which tells *probase* to look for a screen file. On finding the screen file, *probase* will display the data field labels that you painted on the screen earlier and saved

to disk. To actually display some data, you must tell *probase* to get the next record from the appropriate file.

The display entry will actually list the various data fields. In telling *probase* what to display, you must also tell it how long the data field is and where on the screen you would like it to appear.

Another macro command is JUMP (entered by typing J), which can act as both a simple LOOP instruction and an IF-THEN-GOTO statement, as in conventional high-level languages.

Since the Procedure Table is rather



In writing BASIC programs, you can ramble on without any concern for either program efficiency or readability. The *probase* technique does not overcome these problems.

cramped, some additional parameters can be lodged in a completely separate table called the Select Parameter Set. This table is used to arrange tests between values temporarily placed in a *probase* variable and some fixed value (numeric or text). Entries essentially take the form

```
01 Variable 1 = Value 1
02 Variable 1 = Value 2
03 Variable 1 = Value 3
```

and so on as necessary. Decks of such lines can be operated on with Boolean logic if one line is not enough.

A JUMP statement in a Procedure Table can force a switch to a logical test contained in a Select Parameters Set. If the

test condition is true, then subsequent actions occur according to where the JUMP statement forces the program to go next. If the condition is false, *probase* moves on to the next macro statement in the Procedure Table.

The Calculate Parameters Set is used to create calculations such as Field1 \* Field2 = Result Field. The main Procedure Table program dips into a Calculate Parameters Set when it encounters a Calculate statement. The main program knows which lines in the Calculate Set it should go to by the number entered in the Size or Calc column.

A few other assorted tables can or must be used by the *probase* programmer. While the use of macros in formatted tables is theoretically a sensible deprogramming technique, I didn't feel comfortable with it.

In writing programs in BASIC and other high-level languages, you can ramble on without any concern for either program efficiency or readability. The *probase* technique unfortunately does not force you to overcome these problems. In fact, trying to follow the flow of control while reading some Procedure Table code that I generated via Report Gen was a bit like watching a bouncing ball. Dividing program subsections into separate calculation and selection tables didn't help much either.

You can purchase *probase* alone, without the generator modules, at a reduced price, but all you will get is a programming environment. Unless you are truly interested in programming your own database management systems, you'll need to have Quick Gen, Report Gen, and Menu Gen as well.

But the generator modules don't shield you completely from the need to program in *probase*; to use it to its fullest potential, an understanding of its many programming features is essential. Unfortunately, these programming features—and particularly their organizations—are *probase*'s weakest points.

—Robin Webster

(continued)





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# METAFILE: The Price Isn't Right

```

Proc:                               A:STDFORM  Data: C:\G3RESULT Rec: 0 of 0

LASTNAME      :
EMPLNUM       :
DEPTNAME      :
SALARY        :

ITEMS
Space Used: 3%
Items in C:\G3SALARY

Pos Type Len Name
1  C   6  EMPLNUM
2  N   9  SALARY
3  N   9  CHANGE_AMT
4  C   2  CHANGE_MONTH
5  C   2  CHANGE_DAY
6  C   2  CHANGE_YEAR
7  N   4  PCT_INCREASE

Proc:                               A:STDFORM  Data: C:\G3SALARY Rec: 1 of 680

```

**METAFILE screen showing characteristics of salary file fields.**

I reviewed *METAFILE* earlier this year (see "The Metaphysics of *METAFILE*," *PC*, Volume 3 Number 7), and now I'm reviewing it once again. Here's the rest of the story.

*METAFILE*, like many database managers, can be operated in one of three ways: from full prompting menus for beginners or the forgetful, from the command line for the user with medium experience, and from procedures for the advanced operators.

The menu system is one of the best I've seen. It is aptly named the Assistant, and it's a real timesaver for the new user. The

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Assistant menu system will lead you all the way through *METAFILE*'s capabilities. The Assistant has one powerful, unique feature that allows you to access any of *METAFILE*'s features while already deeply involved with a command. This feature lets you examine or update records on one file while modifying records in a second file. While performing one task, you can simply call up the Assistant and ask it to do another task, start to finish, and then jump back to the original job. This proves invaluable in many situations. The Assistant is your avenue into *METAFILE*'s calculator, directory utilities, active system and database status reports, and command menus.

Any of the commands on the Assistant menu can also be entered from the command line. Even if you use the menu system part of the way, you can finish with commands entered on the command line. Once you are familiar with the commands, using the command line is a much faster method of working with databases.

The third mode of operation uses a procedural language that automates data entry and reporting by combining commands

and other subprocedures into one file to be executed from the command line.

## **Data Entry/Modification**

The first step in any database design is to describe the different fields and their data attributes. *METAFILE*'s DESCRIBE command does exactly this. Once you have named the file that you want to create, a form appears on the screen to prompt you for each field's characteristics.

Once the database has been described, the next step is to select that file for data entry/modification with the USE or IN commands. You can then update, change, insert, or delete records at will. Many commands can be used to place the record pointer anywhere in the file you wish: NEXT RECORD, PREV RECORD, FIRST RECORD, LAST RECORD, POSITION, or LOCATE (which finds a record according to specified criteria). Any current changes to the database since the last "save" can be ignored or included using the DISCARD or KEEP commands.

## **Data Manipulation**

One of *METAFILE*'s strongest features is its SORT capability. It's fast. You can select many different fields to sort (called keys), and they can be changed at any time. There are many "qualification" commands that allow you to access or report only certain records within a database. You might, for example, want to update only the records where the Salary field contains a value greater than \$30,000. The FIND command would make only these records active during the sort. Other records can be added to the active ones using the ALSO command. Individual records can be removed from the active list with the DISQUALIFY command.

*METAFILE* has no consolidation or multiple update commands. To accomplish these tasks, you must use the procedural language, which is a slow interpretive language. For instance, *METAFILE* does not have a command to add, say, 14



to each person's age field. You would have to write a procedure to accomplish this job. When you start updating records in one database file based on values in other database files, you're in for a slow haul. The procedural language, combined with the text processor, is flexible and capable, but it is a turtle.

### Data Reporting

*METAFILE* provides a variety of report types. The *ITEMIZE* command produces a record-by-record report. A columnar report can be created using the *LIST* command. A *LAYOUT* feature helps to easily create multicolumn listings of names and addresses for labels. And you can create a report that's as complicated as you want with *METAFILE*'s procedural language.

The procedural language, in unison with the text processor, provides the most flexibility and power by far for data reporting. There are many report-formatting commands to set pitch, form size, copies, footers, headers, page width, page depth, spacing, indenting, and the report destination (screen, printer, or text file). The text processor allows you to take these formatting commands and other conditional commands and combine them in the midst of regular text such as a letter or report. The records can be sorted and evaluated, and specified records and calculations resulting from those records can be inserted anywhere in the text. This provides an easy way to produce form letters or other standard correspondence.

*METAFILE*'s flexibility lies in its conditional clauses, formulas, and functions. The conditional clauses include *IF/ELSE*, *WHILE*, *WHERE*, and *FOR*. Each of these conditionals can control the execution of one or many commands in a block. Formulas can be created using the standard math operators plus exponentiation, add/subtract months, comparisons, pattern-matching, and many other operations. There are 29 built-in functions in *METAFILE*, including functions for date and time, parameter-passing, file and record verifications, absolute values, log-

arithms, random-number generation, and some other helpful functions.

For the most part, *METAFILE* is easy to learn. The Assistant leads you through most everything you need to know, especially when you first start using the package. A program generator that builds a procedure is not included in the Assistant, so learning *METAFILE*'s procedural language is left up to you and the manuals. The *CONVERT* command, which is supposed to allow you to transfer files in Standard Data Format into *METAFILE* files, is not explained well—I couldn't get it to work at all. Besides the *CONVERT* com-



mand, however, the system operates flawlessly. I didn't lose any data, nor did any of the reports do unusual things like they do with some other databases.

### Manual

*METAFILE* could definitely use a newer and better manual. There are too many details left out, too few examples, and some important points are left out entirely. A good technical writer could do miracles with the *METAFILE* manual. The manual comes in three books: two user guides and a reference guide. The user guides were helpful, but I would have liked to see the example data on the disk. The point is probably for the user to experience data entry, but I would have been satisfied with adding a couple of more records to an existing database. The lessons in the user guides do teach the basics, but what is not

in the lessons is hard to find. I would have also preferred to have the information in one 3-ring notebook rather than in three spiral notebooks.

### Other Features

*METAFILE* does have a variety of other nice features. You can create windows for displaying different information or for temporary data entry and prompting. The procedural language can create as many windows as the operator desires—any subsequent displays will occur within those windows. The Assistant itself works in a window and leaves the rest of the screen alone. There is a calculator feature that allows you to try out any functions or computations before using them in a procedure. Another feature, called "Active Context," shows you the present status of all user and system parameters and variables. A communications feature allows you to send and receive data to and from other *METAFILE* users. As you can see, *METAFILE* is not just a plain database.

### Strong and Weak Points

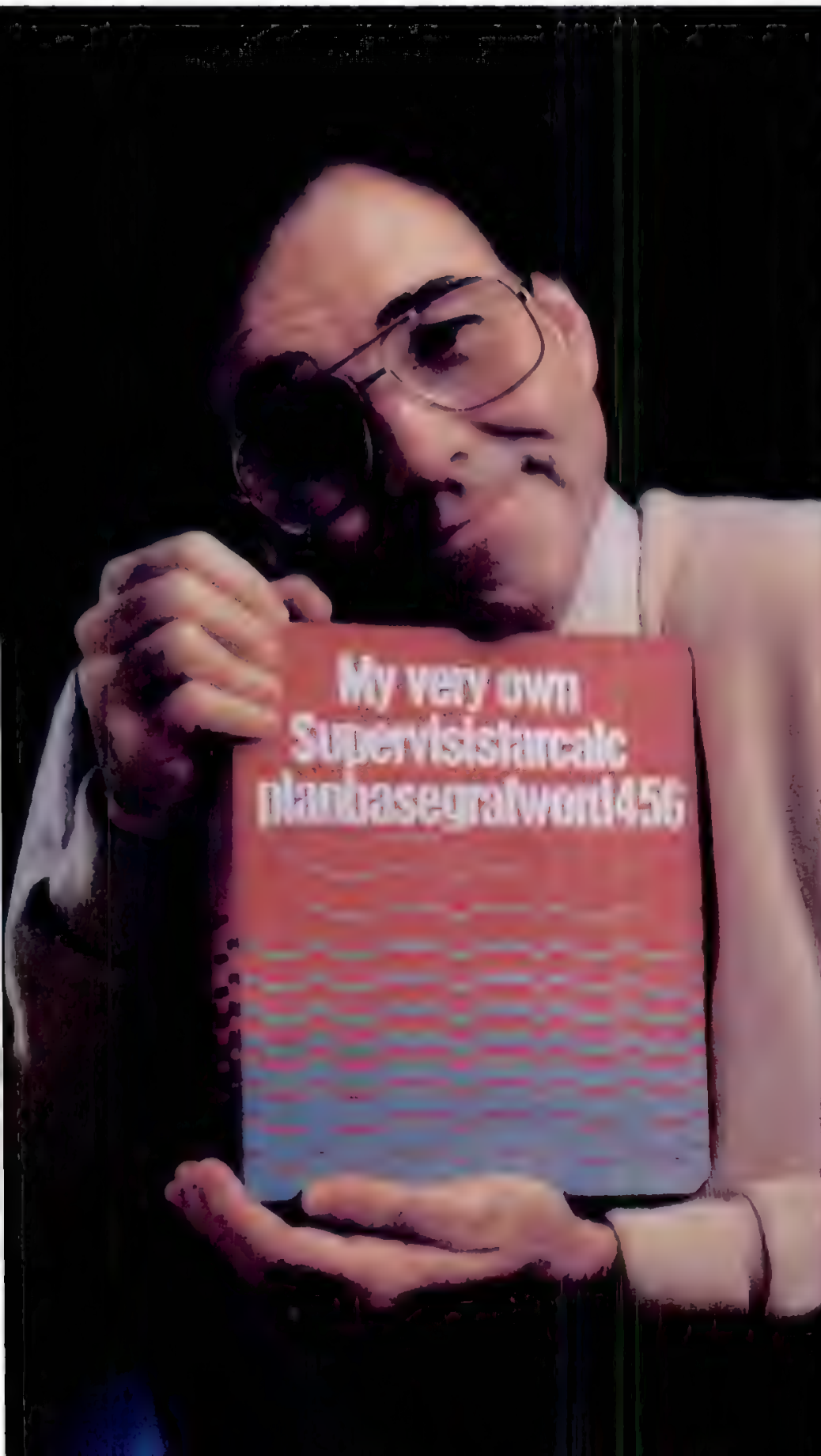
*METAFILE*'s strong points are its almost bug-free operation and its powerful database/text processor, which opens the door for a variety of applications. However, I feel that, considering the explosion of powerful and inexpensive databases in the microcomputer market, *METAFILE*'s \$995 price tag is too high for what you get. I also found it a real hassle to accomplish data consolidations with multiple files. Although it can be done with the procedural language, it takes forever since it uses an interpretive language that's even slower than BASIC. If the manufacturer were to clean up the manuals and reduce the price from \$995 to \$295, *METAFILE* would be a good, competitive package. Maybe \$395 would be a reasonable price if the text processor were upgraded to make it a full-fledged word processor. But until the package is improved or the price comes down, *METAFILE* gives a rather slow return on a big investment.

—George D. Hughes, Jr.

(continued)



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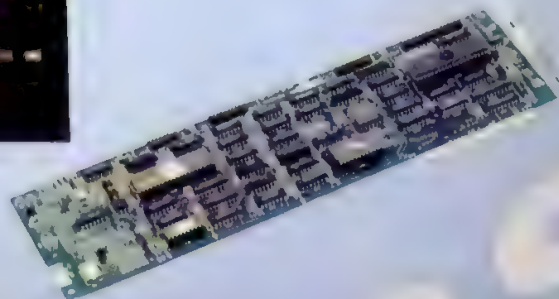
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# PRO-MATIC: Follow the Flashing Screen

REVISE FILE STRUCTURE: persondb						
NO DUPLICATE DATA RECORDS ALLOWED						
DATA ITEM NAME	CLASS	DECIMAL POS	LENGTH	FILE SEQ	INDEX	
fname	ALL CHARS	N/A	1-11	2A		
lname	ALL CHARS	N/A	1-15	1A	KEY1	
empno	NUMERICS	0	6-6			
addr	ALL CHARS	N/A	30			
city	ALL CHARS	N/A	1-20			
state	ALL CHARS	N/A	2-2			
zip	ALL CHARS	N/A	5-5			

ALL EXISTING DATA ITEMS (ALPHABETICALLY ORDERED)			
addr	city	empno	fname
lname	state	zip	

DATA ITEM SELECTION

1-SELECT DATA ITEM, 2-UNSELECT DATA ITEM, 3-FILE CONTROLS

• 220 A

PRO-MATIC screen of the employee file structure.

**P**RO-MATIC consists of two environments: the development environment in which you design and create data fields, files, and application programs; and the run-time environment in which the applications you've developed are actually run, by you or other users.

Although PRO-MATIC supports a hard disk, I tested it with a floppy-based system, on which its performance was not too impressive. I had to swap disks constantly and wait long periods between selecting some menu options and actually getting a response. A hard disk system would have spruced up the performance figures and made me less impatient.

Before I started using PRO-MATIC in earnest, I booted up the demo disk supplied by RG Software Systems. This disk

## PRO-MATIC

RG Software Systems  
P.O. Box 426  
Fort Washington, PA 19034  
(215) 576-0970

List Price: \$595

Description: Relational

Requires: DOS 2.0, 256K RAM, two disk drives,

Records per File: 32,767

CIRCLE 748 ON READER SERVICE CARD

works either in an automatic mode, in which the screen is updated every 10 seconds or so, or a manual mode, in which you respond to prompts.

The demo disk uses flashing and reverse video characters to show you how to build a database with PRO-MATIC. Initially the demo seemed easy to follow, but just beyond the midpoint the examples began to lose their impact, and the flashing characters only seemed to make things more confusing.

I did glean from the demo, though, that PRO-MATIC is an extremely visual program that uses highlighting and split-screen displays to communicate with the user. I also learned that PRO-MATIC takes over the keyboard for its own purposes, using the function keys and many of the other special keys in unique ways. For instance, the plus key on the numeric keypad becomes the Done or Task Completed key, and the ten function keys select menu options.

## Triple Threat

The program itself comes on three disks that contain all the necessary code. Before you can begin to work, however, you must go through an initialization procedure that involves creating a special

boot disk and formatting three other blank disks to be labeled PRO-MATIC Libraries, PRO-MATIC Run-time, and PRO-MATIC Databases.

On the Libraries disk you will store a group of files that PRO-MATIC will need during the database creation process. You'll also store application-specific data on this disk as you complete programs. The Run-time disk creates compiled versions of the applications you develop with the Libraries disk. Library and Run-time disks must be used as pairs; to run a program developed on a particular Libraries disk, you must insert the matching Run-time disk.

This approach requires careful labeling of disks. If you simply identify each disk as Run-time or Libraries, soon you won't have any idea which one you should insert at the Insert Run-Time Disk In Drive B: prompt.

PRO-MATIC tries to be friendly by asking your name when you first boot up and using it in prompts now and then. But

PRO-MATIC  
tries to be friendly  
by asking your  
name when you  
first boot up and  
using it in prompts  
now and then.

this early sign of good intentions is not followed up as thoroughly as you might wish. The main PRO-MATIC menu, which appears next, is filled with confusing keyboard usage instructions. The menu line itself stretches across the bottom of the screen.

Four menu options are displayed, but if you press the F10 key more options appear. You select menu items by pressing the relevant function key. I found that I



had to overcome the urge to use the numeric keypad or main keyboard numeric keys, but the system merely beeped a complaint when I mistakenly tried them.

You must quickly learn that the Esc key is the Quit key, and the numeric pad's plus key is the Done key. You'll need these keys often while developing fields, files, and programs.

### Basic Components

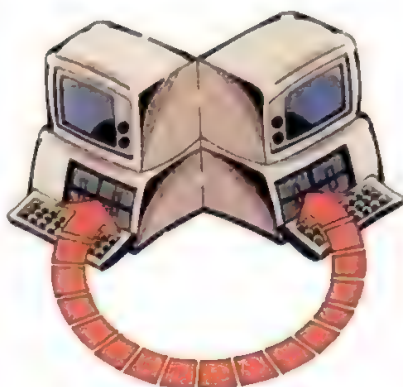
The three basic components of any *PRO-MATIC* application are data items, file structures, and either an accessory model or a program model. Let's first look at the way in which you create a pool of data items, or fields, to include in a file structure. The pool of data fields is referred to in *PRO-MATIC* as a "data dictionary." In a broad sense, the data dictionary is a holding area for information about the structures and types of data available. No actual field contents are stored in the dictionary; it just lists field names, the size and type of each field, the name of the application or applications where each field can be found, and any possible links to other fields.

To begin work with *PRO-MATIC*, I selected option 1 from the main menu and then followed the system prompts until I had entered all the field data. This is a straightforward procedure and should present no problems if you have already listed your field specifications on paper. Field information stored in the data dictionary is always totally separate from the files that will use those fields.

One further step must be taken before a file is created. You must select option 2 (File Structures) from the main menu. When you do so, the screen splits into two horizontal areas: The top area is empty except for some system information, and the bottom area displays all the currently defined fields arranged in alphabetical order, not the order in which you input them. By placing the top area cursor at a required location, pressing a function key, and then selecting a field from the data dictionary, you slowly build a file. You

may select any field, but it can only appear once in a single file.

By first selecting the File Controls option and then the Select Sequence Control option, it is possible to set the order in which records will be stored in a file. Data can be stored in ascending or descending order based on a key field plus two subkey fields. If you don't set up an index in this way, *PRO-MATIC* will store all records in the order in which you entered them. If you wish to create a database that contains records with overlapping information (last name, for example), you may specify this overlap at the same time. The default selection is to have no duplicate records at all.



Until this point, only the first of *PRO-MATIC*'s three disks has been used. To set up the code necessary to enter and retrieve data from a file, you must select the Accessories Kit option and respond to the prompt, Insert the Disk Marked #3 in Drive A:.

After swapping disks, you are faced with what looks like the main menu again. Although the screen is similar, the menu now offers many additional features. If you want to add, retrieve, change, delete, or just list records, you must select option 1, the query/update procedure. After providing a name for the model you are about to create, you then select the file structure that will be used during all query/update

sessions. Selection is again made via a split screen display; the top half shows the new information you are entering, and the bottom half shows a list of all existing file structures.

### Importing Data

At this stage you can either enter new data or import existing files. To import data into *PRO-MATIC* you must use the Convert to *PRO-MATIC* option listed in the Accessories Kit menu. This conversion procedure automatically takes DIF format information into the Pro-Matic environment. A reverse procedure, Convert from *PRO-MATIC*, will take *PRO-MATIC* files and create DIF format copies on disk.

The conversion utility asks for a model name and then goes off to set up the necessary code to do the job. The setup takes no more than 5 minutes to complete. Two types of file formats were provided by *PC Magazine*: a set of .SEQ files that contained pure data field information separated by spaces and a set of .SDF files in which the data fields were contained within double quotes and separated by commas.

The import/export procedure is not lavishly documented; for example, the manual does not explain that ASCII files must have the .ASC extension to be imported. That's no big problem unless you find out only after you are locked into the conversion procedure—as I did. I was disappointed that *PRO-MATIC*'s documentation and screen prompts didn't inform me of the .ASC requirement in good time. After renaming the relevant files, I tried the conversion procedure again with the import model I had previously saved.

I first attempted to import the .SDF files. Everything seemed to be going fine until the conversion stopped after about 18 minutes with only 470 records out of 500 records entered. When I checked the file I realized that *PRO-MATIC*'s ASCII import feature hadn't liked the double quotes and commas as delimiters. The fields were all garbled and out of sequence and double quotes and commas were everywhere. My

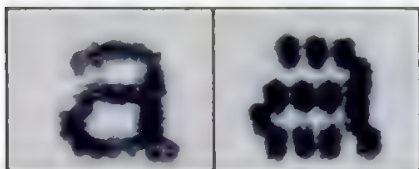


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attempt to import the vanilla ASCII files met with no success either—after 20 minutes the conversion stopped short of the 500 mark.

### Building Program Models

Actual application programs are created in *PRO-MATIC*'s programming environment. Although you can dictate what appears on the computer screen and which files are read next, *PRO-MATIC*, for example, automatically builds the program structure with a set of standard program statements.

First, you create all the data fields you require, presuming that they are not already available from the data dictionary. Next, a screen format has to be painted on the screen as you wish it to appear in the end-user application. Three types of data displays are possible: the form, the list, and the menu.

A form is used when you wish to output the contents of one or more databases to the computer screen or an attached printer one record at a time. Data can also be entered into selected record fields. The list style of data display is useful when you want the ability to list multiple records from a single database at one time on the screen or a printer.

The most flexible data display is the menu, which provides you with the ability to list multiple records from a database and to then select specific records for data entry or updating. Forms can be linked to menus so that a single menu listing can provide access to more detailed information held in various files.

The *PRO-MATIC* method of painting the screen with data fields is similar to other systems, but the data fields available are displayed in the lower half of the screen. *PRO-MATIC* allows you to use the values stored in data fields for simple computations. Calculations can add two fields to produce the value in a third field or increase that of a single field by a specific amount each time a condition is met.

*PRO-MATIC*'s "processing sequence" feature turns simple data into applications.

If you select the Program Models option at one of the main menus, you will be confronted with a split-screen display. The bottom half contains all the available procedure models; the application program, or processing sequence, will be built in the top half.

Using the processing sequence feature is a bit like painting by numbers. Initially the top half of the program development screen is quite bare. It contains only a couple of basic statements: Create New and



The import/export procedure is not lavishly documented; for example, the manual does not explain that ASCII files must have the .ASC extension.

Start of Program Model. The various programming statements are invoked via the Select Procedure option on the menu along the bottom of the screen. Using the Special Commands option you can also set up a processing command that will query the data entry operator for specific information. If you were to build a personnel database to report on salary levels in all company departments, it might be useful to provide on-screen prompts that ask the data entry operator questions like, "Which department roster would you like to view?" or "What salary level do you wish to search for?"

The Define Decisions option provides the ability to carry out logical tests on data. The form

IF salary IS LESS THAN  
OR EQUAL TO 30,000

would test the value entered to see if it were equal to the preset amount. If not, other conditions could be tagged on.

### Pros and Cons

With time and effort, full and complex applications can be developed with the *PRO-MATIC* programming environment. I like the idea of allowing the user to enter the application-dependent information—file and field names, for example—while *PRO-MATIC*, like a vending machine, dispenses program statements. I also like the way *PRO-MATIC* uses split screens to indicate what currently existing resources are available for application development.

The documentation is thorough with lots of examples, but it seems to assume that you will read it from beginning to end, simultaneously carrying out all the exercises. Beginners and database jocks alike should give every section a once-over because *PRO-MATIC*, like every database system, tends to have its own way of doing things.

I have three major criticisms of *PRO-MATIC*. First, despite the fact that it is a very visual system, the screen designs can be confusing if you've created many data fields and files. Second, since *PRO-MATIC* is supplied on three system disks from which you must create at least three more, keeping track of which disk should be where and what they are called is a full-time job in itself. I began to feel like a card-shark dealing a hand. Finally, *PRO-MATIC* is something of a Rip van Winkle; every now and then it goes off into a comatose state.

*PRO-MATIC* is certainly chock full of features. Such features, however, are useful only if they can be easily used to produce fast solutions to complex problems. Here, unfortunately, they cannot. While the program is a powerful one, its strongest points are too difficult to learn and use correctly. The usual power versus ease-of-use conflict has been resolved in *PRO-MATIC*—and the user has lost.

—Robin Webster

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occur at the time a sale is being made—that is, at the “point of sale.” A package that addresses this need is now available for the PC from Great Plains Software (GPS). *Inventory Management with Point of Sale Invoicing* has been designed to facilitate transactions that occur at the cash register. In its latest release, GPS has included two major enhancements: First, you can now interface your PC directly to a cash drawer, causing the drawer to open when a cash transaction occurs. Second, the system will produce a sales slip, documenting each sales transaction for your customer while automatically updating your inventory records.

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1701 S.W. 38th St.  
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(701) 281-0550

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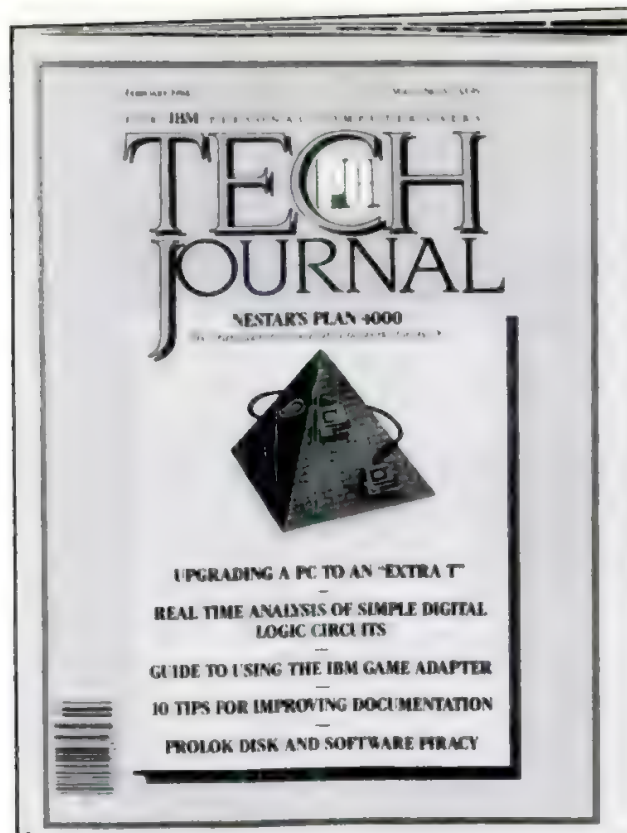
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## INVENTORY CONTROL

turnover rates. At any moment, you can print reports to show exactly what items are in stock, how much of each item you have, how much the inventory cost you, what items are out of stock, and what items are on order from suppliers. The system could also be used in handling the inventory accounting chores for wholesale businesses—especially those with retail-like operations such as mail-order.

The system is part of *Great Plains Hardisk Accounting Series*, which also includes *General Ledger with Budgeting and Financial Reporting*, *Accounts Payable*, *Accounts Receivable*, and *Payroll*. Each system can be purchased and used independently or integrated with the others, which will eliminate the process of making multiple entries. The only exception is that when integrating *Inventory* with *Accounts Receivable* or *Accounts Payable*, the *General Ledger* must also be used. GPS has indicated to us that it will soon be releasing a *Job Costing* system, a facility that it calls "Rapid Transfer" (allowing you to transfer your GPS accounting data to programs such as *1-2-3*), and a multi-user version of its *Hardisk Accounting Series*.

The *Inventory* system's functions can be grouped into:

- Inventory maintenance (used to establish and maintain the inventory items you stock);
- Inventory receipts transaction processing;
- Point-of-sale transaction processing;
- Inventory and sales reporting (some 29 different reports for inventory valuation, sales history, audit trails, and so on);
- Various system maintenance routines (allowing you to customize the format of your sales slip and make other minor modifications to the system).

### Setting Up

In Figure 1, the first of the inventory maintenance screens, you will notice two fields labeled Prod. Category and Generic descr. The first is a three-character field used to sort and group items of a particular

product line. For example, assume you use COM as a product category for all the computers you stock, and one of your wholesale customers wants a price list for computers only. A price list could be printed for the COM product category alone—as opposed to producing a price

### The system offers attractive inventory item pricing alternatives.

list of all the items you stock. "Generic description" is a ten-character field used to group items by classification. It simply provides you with another means of classifying, sorting, and reporting your inventory.

Also on Figure 1, you will notice three commission fields (type, rate, and percent). Consistent with its retail/wholesale trade orientation, the system will compute and report sales commissions (if based on the sale of an item) as a percentage of the

item's price, a percentage of the item's cost, a percentage of the profit made from the sale of the item, a set dollar amount, a set dollar amount plus any of the percentages noted above, or it will report that no commission at all was earned.

### Running Promotions and Sales

Figure 2 contains several fields titled Promotions and Sales. Sales promotions are a basic tool used by retailers and wholesalers to stimulate sales. The manner in which promotions—especially price promotions—are carried out can affect your computer system requirements, and few microcomputer-based inventory systems address these needs.

Setting up an item for a price promotion is easy with *Inventory*. The Name of your particular promotional event can be entered using a description of up to seven characters. The promotion period can be entered in the form of a Starting Date and Ending Date. And, finally, a Discount Type and Amount can be established and used to calculate and display the promotional price of an item during point-of-sale

INVENTORY MAINTENANCE		- INV.1.2.A -		Number active: 40	
CHANGE ITEM				Number unused: 10	
1. Item number	MAX-PC				
2. Description	128K Computer - Maxcell	---- Taxable ----			
3. Item type	Sales Inventory	11. Sales Tax # 1	No		
4. Re-order number	1039	12. Sales Tax # 2	Yes		
5. Vendor number	MAXCELL	13. Sales Tax # 3	No		
6. Prod. Category	COM	14. Ship weight	20.0		
7. Generic descr	COMPUTER	15. Back Order	Yes		
8. Substitute # 1	1033	16. Ship by U.P.S.	Yes		
128K Computer - Bayshore		17. Commission type	Percent Price		
9. Substitute # 2	1036	18. Commission rate	.00		
128K Computer - Canyon		19. Commission pct.	7.5		
10. Serial numbers	Yes	20. Inventory acct.	1 HARDWARE		
		21. Retain History	Yes		
		22. Avg Lead Time	16.0		
		23. # of Invoices	1		

Any Change ? No

**Figure 1:** The first Inventory Maintenance screen. 1. The item number can be up to 15 characters, descriptions up to 30 characters. 2. This entry indicates that you have allocated enough disk file space for 50 inventory items. 3. A "yes" answer here indicates that you want the system to allow you to backorder. 4. "Yes" here will cause the system to request product serial number information. 5. This identifies the inventory financial account code used to summarize the financial impact of inventory transactions. 6. Responding "yes" will cause the system to accumulate information on the quantity sold, total sales, total cost of sales, and quantity sold last year for this item. 7. This item is automatically calculated each time inventory is received.

transactions. The discount can be in the form of a dollar amount or a percentage. A Promotion Sales Report, listing all items on promotion, is available to monitor the effectiveness of your promotion for a particular item.

What GPS calls "User Categories" can also be found in Figure 2. The system allows you to define up to six user-defined data fields to be associated with each of your inventory items. This allows your inventory file to maintain information that is unique to your business and lets you produce inventory reports sorted by these user-defined data fields.

## Pricing Your Merchandise

The system offers attractive inventory item pricing alternatives (see Figure 3). When setting up an inventory item, you must decide how you want to price the item. You can price items based on a combination of quantity-discount price breaks and customer price levels (for preferred or different types of customers). You must also select a method to calculate the price of the item. If you assign different prices for the same item to the three available quantity-discount breaks, item purchases meeting the quantity break limitations are automatically given the correct price in point-of-sale transactions.

When the system is used with *Accounts Receivable*, you can define five levels of pricing per quantity discount break. Each customer is then assigned a price level for each of the three quantity discounts. This offers you 15 prices per item. Again, the price used during a point-of-sale transaction will be a function of the quantity purchased and the purchasing customer's assigned price level.

The actual prices set for each customer price level are also a function of the four methods the system can use to compute the price of an item. A Dollar Amount, for example \$100, can be entered and will be used as the actual selling price. A Percentage of List Price can be used to calculate the selling price by multiplying the list price by the percent entered (including

INVENTORY MAINTENANCE		- INV.1.2.B -	
CHANGE ITEM	Item Number MAX-PC	128K Computer - Maxcell	
1. Unit name	Each	10. # Places for \$ amounts	2
2. # Places for quantities	0	11. Qty in use	2
3. Beginning qty	0	12. Qty service dept	0
4. Qty on hand	0	13. Qty returned	0
5. Qty on order	5	14. Qty damaged	0
6. Qty allocated	2	15. Last order qty	0
7. Qty back ordered	3	16. Last order date	
8. Re-order level	5	17. Last recpt date	
9. Econ. Ord. Qty.	1	18. Standard cost	.00
		19. Current cost	608.75
----- Promotions and Sales -----		----- User Categories -----	
20. Promotion	Yes	26. Minimum Memory	128K
21. Name of Sale	MAXCELL	27. Maximum Memory	512K
22. Starting date	4/01/83	28. Floppy Drive(s)	2
23. Ending date	4/30/83	29. Hard Disk Drive	0
24. Discount type	1	30. Operating System	MS-DOS
25. Discount percent	15.00	31. Expansion Slots	5
Any Change ? No			

**Figure 2:** Inventory screen showing promotions and sales. 1. The Unit Name can contain up to eight characters. Quantities can contain zero, one, or two decimal places. 2. The system automatically decreases this field to reflect the number of items received. You must manually update it to reflect new purchase orders. 3. These fields report those items not available for sale. 4. The Purchasing Advice Report lists all items less than or equal to the "re-order level," suggests quantity to re-order based on the "economic order quantity," and states the "minimum order quantity" for each vendor. 5. These fields are automatically updated.

INVENTORY MAINTENANCE		- INV.1.2.C -	
CHANGE ITEM	Item Number MAX-PC	PRICE LEVELS	
	128K Computer - Maxcell	Qty break #1	Unit Price
		7. Level 1	100.00   1,217.50
		8. Level 2	95.00   1,187.06
		9. Level 3	90.00   1,156.62
		10. Level 4	85.00   1,126.18
		11. Level 5	80.00   1,095.75
----- QUANTITY BREAKS -----		Qty break #2	
Quantity	Description	12. Level 1	90.00   1,156.62
1. 1	Each	13. Level 2	85.00   1,126.18
2. 2	Two	14. Level 3	80.00   1,095.75
3. 3	Three	15. Level 4	75.00   1,065.31
		16. Level 5	70.00   1,034.87
5. Purchase unit (1,2,3) 1		Qty break #3	
6. Price by Percent Markup of Current Cost 608.75		17. Level 1	80.00   1,095.75
		18. Level 2	75.00   1,065.31
		19. Level 3	70.00   1,034.87
		20. Level 4	65.00   1,004.43
		21. Level 5	60.00   974.00
Any Change ? No			

**Figure 3:** 1. The Description is assumed to be the Unit Name. 2. The first description for the quantity discount breaks is a default from the Unit Name field. Retail customers might be assigned one price level and wholesalers another. 3. For each quantity, you can establish up to five price levels.

percentages greater than 100 percent). For example, entering 90 percent along with the \$100 entered above would give a price of \$90. A Markup Percent can be taken as a percentage of the current cost, and this percentage will be added to the current cost to get the selling price. Entering 20

percent in this case would result in a price of \$120. Finally, a Percent of Margin can be input to determine the item's gross profit based on its final sales price. Entering 20 percent here results in a price of \$125. As you can see, the system provides a great deal of pricing flexibility.



# INVENTORY CONTROL

## Receiving Your Goods

Receiving merchandise with the GPS system is relatively straightforward. Figure 4 shows the first of two screens used to enter inventory receipts. The system documentation discusses how to handle the recording of transactions in which you receive a shipment prior to the associated invoice, receive an invoice prior to the associated shipment, or receive the merchandise and the invoice together. Unfortunately, many distribution businesses receive merchandise (and must record the receipt of these goods) prior to receiving the associated invoice. Again, because many distributors use a perpetually calculated moving-average cost to value their inventories, they must make an estimate of the "landed" cost when they enter a receiving. The GPS software provides you with a good deal of flexibility in this regard, but users must control, administratively, how certain of these transactions are entered. The accounting can get "hairy" if you choose to receive merchandise at a zero (or some otherwise inaccurate) cost and then sell a portion of this stock prior to your recording the associated invoice.

You can choose to value your inventories using LIFO, FIFO, Weighted Average, or Standard Cost. If you choose LIFO or FIFO, you can specify that it be calculated on a perpetual or a periodic basis.

## Floor Planning

The use of "floor-plan" or "flooring" inventory financing arrangements is common to retail operations marketing "high-ticket" items. Floor planning is an inventory financing agreement with a supplier (or other third-party creditor) that provides for payment of inventory items upon their sale or the expiration of a set period of time, whichever comes first. Because the amount financed at any given time is a function of the actual, "identifiable," items in inventory, it is common that goods financed in this manner be tracked by serial number. As you might imagine, this can present a recordkeeping night-

INVENTORY RECEIVING ENTRY - INV.4.1.A - ADD	
Receipt number	44
1. Transaction type	Inv/Bhpat
2. Shipment received ?	
3. P.O. number	1200
4. Vendor number	MAXCELL
5. Invoice number	MAX1673294
6. Invoice date	4/01/83
7. Invoice amount	1,259.50
8. Terms	Net 30 days
9. Check number	0
10. COD Amount	
11. Disc percent	2.0
12. Disc amount	
13. Order date	3/15/83
14. Disc date	4/10/83
15. Due date	5/01/83
16. Floor plan date	5/01/83
Any Change ? No	

**Figure 4:** 1. This title can be used to locate instructions in the documentation. 2. The last vendor number/name is automatically displayed. 3. When integrated with Accounts Payable, the vendor terms can be displayed here. 4. The Order date field calculates the average lead time for an item.

POINT OF SALE - INV.8.1.A -		Sales Slip # 1006	Sls person JONES01			
Name Robert Smith		SHIP TO:				
Adr1 Data Processing Manager		Name Robert Smith				
Adr2 P.O. Box 1560		Adr1 Gold River Plaza Building				
City Sacramento St CA		Adr2 537 Gold River Run				
Zip 95814-1560		Adr3 Sacramento, CA 95810				
#	Quantity	Item Number	Description	Price	Extension	
1	1.....	MAX-PC	128K Computer - Maxce			
					Total	.00
Price Breaks					*** MAXCELL PROMOTION ***	
1-	1/	1,217.50	Suggested Price	1,217.50		
2-	2/	1,156.62	Discount	15.00%		
3- UP	/	1,095.75	Promotion Price	1,034.87		

**Figure 5:** 1. If integrated with the Payroll System, the Salesperson number can be linked to an Employee number. 2. Based on the sales quantities entered, a quantity discount description and sales price will be displayed. 3. Promotional information is displayed here including the suggested price and the discount.

mare for high-volume businesses.

The developers of the GPS *Inventory* system sought to ease this burden by helping you track and report your inventory items by serial number. The system facilitates your use of floor-planning agreements through the use of a "floor-plan date" (see Figure 4). The floor-plan date is tied to the serial numbers of the items you receive. To effectively manage your financing of this merchandise, the system provides you with a serial-number aging

report. This report can be used to determine the number of days of "free" financing remaining for each item, along with the number of days each serial-numbered item has been in stock.

While these features are quite helpful, GPS could have gone a step further. Many retailers use more than one creditor to floor their goods, but the system provides no means to identify the flooring company for each item. A list reporting the status of all floored items—including those that

have been sold—would also have been useful. This kind of report could summarize, at a moment's notice, the amount financed, the amount owed, and the amount due *now* to each of the flooring creditors.

### Point-of-Sale Routines

Clearly, the most unique feature of the GPS *Inventory* system is its point-of-sale orientation that assists you in accounting for over-the-counter sales activities. The requirements placed upon a system in this environment are, indeed, demanding. Response times must be immediate, and nothing (but *nothing*) should cause significant delays in processing sales-counter transactions.

Using the screens shown in Figures 5 and 6, salespeople merely enter customer, merchandise, payment, and tax data. (Of course, serial numbers also have to be entered if you're using them.) The pricing of your merchandise (promotional pricing as well as quantity-discount price breaks) is handled automatically, along with the printing of a sales slip showing all sales/payment information.

To accommodate the point-of-sale process as far as possible, GPS has developed a means of having the computer automatically open the cash drawer for you. With

this system, you physically connect a cash drawer to your PC via a serial or parallel port. GPS claims that any cash drawer "with electronic pulse" will work. Once connected, your PC functions like a cash register, handling transactions such as

**Nothing (but  
nothing) should  
cause significant  
delays in processing  
sales-counter  
transactions.**

cash sales, account sales, returns, and quotes (which are assigned a sales slip number so you may recall them at any time for reference or to be converted to an actual sale).

The system also recommends the oldest/newest serial-numbered item for sale (depending on your inventory valuation method) and suggests user-defined substitutions for out-of-stock items. However, the system is only capable of printing multiple invoices (sales slips), more commonly known as batch invoice processing. This limitation could present a problem for

wholesale operations.

Using other parts of the Great Plains *Hardisk Accounting Series*, in conjunction with *Inventory* adds additional capabilities:

- When processing inventory receipts, the *Inventory* system can automatically enter the purchase cost of the items received into the *Accounts Payable* system;
- Customer charge sales can be automatically forwarded to the appropriate customer account in the *Accounts Receivable* system;
- Commissions payable to salespeople can be passed to the appropriate employee's record in the *Payroll* system. If merchandise is returned by the customer and the commissioned salesperson number is entered, the payroll records can be adjusted accordingly.

### Inventory and Sales Reporting

The *Inventory* system uses an impressive array of reports for inventory valuation, sales history, and audit trail purposes. The Inventory Turnover Report calculates a physical turnover rate for each item in stock, figured as follows:

$$\frac{\text{Quantity sold year-to-date}}{\text{Average monthly inventory}}$$

Turning inventory is what the distribution business is all about. When properly used, this report can help you monitor your inventory activity. Excessive inventory can result in unexpected losses due to depreciation, obsolescence, changes in demand, and financing costs. Carefully monitoring the inventory turnover rate of important items will assist you in planning future purchases, controlling costs, and planning future sales promotions.

The system also provides other reports summarizing important categories of information. For example, the Inventory Item List provides detailed information on each item. Ordering and shipping detail, and price and cost information is supplied. In addition, a Price List details each customer's established price level. Quantity-

POINT OF SALE		- INV.8.1.B -		Sales Slip # 1006		Slip person JONES01	
Name Robert Smith				SHIP TO:			
Adr1 Data Processing Manager				Name Robert Smith			
Adr2 P.O. Box 1560				Adr1 Gold River Plaza Building			
City Sacramento St CA				Adr2 537 Gold River Run			
Zip 95814-1560				Adr3 Sacramento, CA 95810			
Enter Payment Options:				Payment Options:			
Total	2,069.74	.00	1. Cash	1,000.00	2. Check		
Tax	124.18	.00	3. Credit Card				
Other Charges	.00	1,193.92	4. Charge				
Grand Total	2,193.92	2,193.92	Total Received				
P. O. # : Data Processing Dept.							
Comments: Install On April 5th							
Call Before Installation							
Accept, Reject, Edit payment A							

**Figure 6:** 1. Three different types of taxes can be computed for each item. 2. The multiple payment option may be specified as customer purchases are entered. 3. Two "Comment" lines of up to 30 characters each can be printed on the sales slip.





# APPARAT

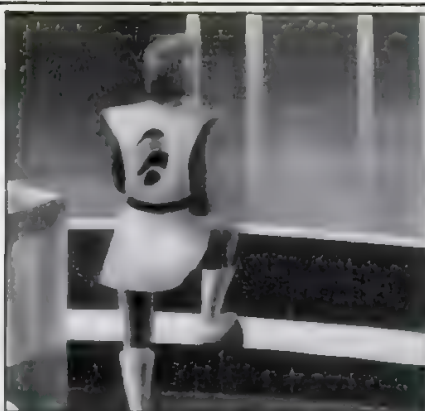
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## INVENTORY CONTROL

status information can be found in the Inventory Stock Status Report, which provides data on each of your items (stock on hand, on order, and back-ordered) as well as your current and actual cost, and total inventory value. Finally, a Sales Analysis by Product Category can be prepared and sorted by either the vendor or product category. This report can list either detail or summary information with month-to-date or year-to-date totals.

Other reports include a Purchasing Advice Report (items that are at or below their reorder level), Purchase Receipts Report (with month-to-date receipts in detail or summary), Serial Number Aging Report (showing days in possession by serial number), a Quotes History Report, an On-order Report, a Backorder Report, an Inventory Receiving Edit List, an Inventory Receiving Journal, a Detailed Sales History Report (sales slip detail), a Detailed Sales Report, and a Sales Commissions Due Report.

The GPS software provides for data security through a system of four-character security passwords. These can restrict access to the entire GPS accounting series, the individual systems, or particular programs within each system.

### Set-up, Maintenance, and Documentation

Setting up the system is not difficult. (If you have never worked with a system using the UCSD p-System, a few terms may be foreign to you.) You first need to estimate your inventory activity and set aside an appropriate amount of space for your inventory files. (The system theoretically accommodates 32,000 items, but GPS recommends using no more than 6,000 items.) This way, a host of company data can be input to meet your individual needs, including your company's name and address, password security codes, printer control codes, and so on. The administrative routines supplied with the system include utilities to back up and restore your data files.

While the system installation proce-

dures are simple enough, they have one major shortcoming. They are designed to be loaded into what is termed the "root" (or main) directory of your hard disk, leaving you with an inability to process transactions for more than one company. Someone well-versed in disk procedures and UCSD Pascal utility commands could provide multiple-company capability by manipulating the placement of your files on the hard disk. This is accomplished by manually setting up your separate (or multiple) companies on the hard disk in a sub-directory and will allow you to set up as many companies as you need, depending on the amount of disk space available.

Professionally packaged documentation (in gray pinstripe, no less) is provided with the system. Each chapter is straightforward and easy to follow, except for some of the data-input field explanations. The authors supply an explanation for each input field, but their explanation is not always clear enough to spell out the use and impact of each of the data fields. The documentation assumes that you have a basic understanding of accounting principles and that you have read the computer, hard disk, and printer manuals.

GPS maintains an ongoing policy of providing direct telephone support to end users at no charge. A toll-free telephone number is provided and support representatives are available to answer any questions you might have. The company's response to our questions was adequate.

### Summary

With its unique point-of-sale orientation, the GPS *Inventory* system should be a candidate for retailers considering the use of a PC in an over-the-counter sales environment. Remember, selecting a software package for your business is a matter of comparing your specific needs with the specific features of the packages available. For retailers and wholesalers with retail or retaillike operations, this system should be on the list of packages to evaluate. Demonstration packages are available from GPS for \$25.—G. William Dauphinais





# NewWord: A WordStar Double At Less than Half the Price

NewWord's manufacturers plan to give MicroPro a run for its money with this budget-priced clone of the ever-popular WordStar. Here's how the new kid on the block stacks up.



**N**ewWord is challenging WordStar head on. This WordStar clone, marketed by Rocky Mountain Software Systems, is featured in an ad that shows an old-fashioned balance scale—the kind that the blindfolded Grecian figure called “Justice” usually holds. One balance pan contains a tall stack of dollar bills labeled “WordStar MailMerge \$645”. In the other pan is a shorter stack labeled “NewWord MergePrint \$249.” The caption proclaims: “When it comes to the two best word processors, it’s a question of weighing the differences.” The implication is that NewWord has the power of MicroPro’s WordStar/MailMerge combo at less than half the price.

Can margarine really taste just like the high-priced spread? In this case, surprisingly enough, the taste is quite similar. NewWord comes close to its renowned

competitor—although the discriminating palate will still sense the difference.

NewWord is the result of the efforts of three former MicroPro employees, Stan Reynolds, Peter Mierau, and Richard Post, who left in November 1982 to form a company called NewStar. The trio decided to produce NewWord because, according to Reynolds, “We thought we could do a better job.”

NewStar has been selling a CP/M version of NewWord since last October, and it began to market the IBM PC version in March. NewStar isn’t afraid of a lawsuit from MicroPro, Reynolds says, because although NewWord is a WordStar look-alike, the program code is original. He adds that MicroPro has had an evaluation copy of NewWord since last November, “and if the company were going to move it would have done so by now.”

Although the folks at MicroPro aren’t talking, I’ll bet they did a double take the first time they saw NewWord.

### A WordStar Clone

NewWord looks so much like WordStar that it could almost be a different release of the same program. It has WordStar’s menu structure and most of the same commands. Like WordStar, it greets you with an opening menu (see Figure 1) that leads you into its main functions. Most of the time you will choose D to retrieve a document from disk or to create a new document. In WordStar/NewWord terminology, a *document* is a text file upon which the program can perform its word processing magic. If you look at a NewWord document with the DOS TYPE command, you’ll see bits of ordinary-looking text interspersed with strange



## NEWWORD

hieroglyphics. Both programs understand these codes, so *NewWord* and *WordStar* can read each other's documents.

If you want to use *NewWord* as a program editor or to write DOS batch files, you'll have to choose N for nondocument. This unhappy choice of terminology, also inherited from *WordStar*, simply means that *NewWord* will forgo the hieroglyphics and store your text as a straightforward ASCII file, which can be easily understood by compilers or other programs that need ASCII input. When you use this nondocument mode, you lose word wrap and have to end each line with a carriage return as if you were using a typewriter. You also lose a number of other editing features, including automatic centering, the ability to set tabs and line spacing, and right justification.

Once you start writing either a document or a nondocument, you choose program options by pressing the Ctrl key in combination with a letter. Ctrl pressed with Y (Ctrl-Y) deletes a line, Ctrl-T deletes a word, and Ctrl-B realigns a paragraph. Some control keys take you to auxiliary menus that lead you into other program options. For example, Ctrl-K brings you the Blocking and Saving menu (see Figure 2) and Ctrl-Q brings you the Quick menu (see Figure 3).

When you're ready to print, you can control print formats like page length, margin size, and spacing by placing dot commands next to the left margin of your text. For example, the command .LS2 tells *NewWord* to double space your text. As in MicroPro's *MailMerge* program,



### *NewWord*, Version 1.29

Rocky Mountain Software Systems  
P.O. Box 3282  
Walnut Creek, CA 94598  
(415) 680-8378

List Price: \$249

Requires: 96K RAM, PC-DOS, one disk drive.

CIRCLE 800 ON READER SERVICE CARD

O P E N I N G   M E N U	
D get a document to change, create a new document	L change logged disk drive
N create or change non-document	E rename a document
P print a document	O copy a document
M merge print a document	Y delete a document
C protect a document	F turn directory off
X all done with NewWord (exit)	J help

Figure 1: Like *WordStar*, *NewWord* greets you with an opening menu.

B L O C K I N G   &   S A V I N G   M E N U			
SAVING	BLOCKING		DOCUMENT
S save & resume edit	B mark start	C copy	O copy
D save document	K mark end	V move	J erase
X save & exit NewWord	H hide/show	Y delete	L change logged drive
Q quit without saving	W store to disk		R insert a document from disk

Figure 2: *NewWord*'s Blocking and Saving menu is entered by pressing Ctrl-K.

dot commands also let you create personalized form letters by inserting the correct name and address into each letter.

*NewWord* has reproduced the *WordStar*/*MailMerge* command structure almost in its entirety. Of 143 *WordStar* editing and print control commands, *NewWord* uses 121 to control identical functions. What about the other 22 commands? *NewWord* doesn't offer comparable features for 18 *WordStar* commands.

In four instances *NewWord* uses a different command to invoke a *WordStar*-like feature. In the opening menu, *NewWord* uses J to call the Help menu while *WordStar* uses H. By my calculations, *NewWord* has 87 percent of the power of *WordStar*/*MailMerge*. Now, 87 percent of the power at less than half the price isn't a bad deal, especially if none of the miss-

ing features are on your "must have" list.

However, such an index is at best an approximation of the similarity of the two programs. There are differences that are harder to quantify. For instance, the two programs operate at different speeds. *WordStar* Version 3.3 scrolls to a new screen in less than a second, while *NewWord* takes almost 3 seconds to rewrite a new screen. *NewWord* makes up for some of this lost speed by not pausing to read from disk as often as *WordStar* does, so while *WordStar* will make your disk drives grind when you change help levels, delete a line, or pull in a menu, *NewWord* does the same thing more quickly with program code that's already in memory.

There are other differences, too. *WordStar* can run on a PC equipped with 64K



RAM, while *NewWord* requires 96K. Both programs use spill files on disk to hold sections of long documents that don't fit into RAM, but *NewWord* can hold up to 15 pages of text in internal memory while *WordStar* holds only 7. That means *WordStar* has to read from the disk more often when you're editing a large document.

And unlike *WordStar*, *NewWord* comes with a kind of "piracy protection." This isn't copy protection in the usual sense; you can make as many backup copies of your *NewWord* disk as you like. But before you can run the program, you have to call Rocky Mountain Software to learn the special code that will "unlock" your disk. This procedure also causes your name to appear on the program's opening menu, which may embarrass those who try to use pirated copies.

There are areas in which *NewWord* actually goes *WordStar* one better. For starters, *NewWord* has an "undo" key. If you've ever accidentally deleted sentences or even entire paragraphs, you'll appreciate this feature. By pressing Ctrl-U, you can recover the last thing you deleted. *NewWord* has a buffer in which it temporarily stores all deleted text. If you don't mind living dangerously, you can cut and paste from one section of your text to another by deleting and then recovering. *NewWord* comes with a buffer that will hold up to 100 characters, but you can increase the buffer size with *NewWord*'s installation program. I used *NewWord* with a 10,000-character buffer that rescued me from the inadvertent deletion of several pages.

Another plus for *NewWord* is its simple installation program and related utilities. You can bypass complicated options, such as deciding on the size of the delete buffer, until you know more about *NewWord*. Later, you can run the installation program again and make such decisions as how many menus will appear on the screen, whether text will be right justified, and whether *NewWord* will create an automatic backup whenever you save a file.

*NewWord* provides two handy utility

Q U I C K M E N U			
SCROLLING			
CURSOR	R top of document	FINDING	OTHER
E upper left	C bottom	F find	B align paragraphs
X lower right		A find & replace	
S left end	ERASING		P find a page
D right end	Y line to right	(line if nondoc)	
	DEL line to left		

Figure 3: The Quick menu is entered by pressing Ctrl-Q.

programs, NWKEY and NWCOLOR. NWKEY lets you assign *NewWord* commands to the PC's function keys, both unshifted and in combination with Ctrl, Shift, and Alt, giving you a total of 40 function keys. In contrast, *WordStar* 3.3 only allows you to define the ten unshifted function keys. NWCOLOR lets you decide what colors to work with on a color monitor, or the intensity of your characters on a monochrome display.

Color and intensity take on a bit more importance in *NewWord* than in *WordStar*, because *NewWord* tries to give you something extra in the what-you-see-is-what-you-get department. If you want a phrase to appear in boldface (Ctrl-PB), *NewWord* can display the phrase in high intensity video or in any of the PC's colors. You can also choose the color or intensity for normal text, strikeouts, underlined text, subscripts, superscripts, and doublestrikes.

In the realm of print formatting, *NewWord* has improved on *WordStar* by permitting headers and footers with multiple lines. It has a nifty new dot command, .RR, which inserts new margins and tab settings into the text. *NewWord*'s editor recognizes the .RR command, so you can include up to seven different ruler lines in your document without having to change margins with the Ctrl-OF command.

*NewWord* also has some extras for people who use dot matrix printers. I tested it with my Epson MX-100 printer and found

to my surprise that my printer was able to produce a kind of microjustified text. I'd always thought that microjustification, the insertion of "microspaces" between letters to create a straight right margin, was strictly the province of high-priced letter quality printers. But *NewWord* gives us dot matrix printer owners a kind of poor man's microjustification. As opposed to the high-priced version in which the printer randomly inserts 1/120-inch slivers of space between letters, the dot matrix printer version inserts larger microspaces, 1/60 of an inch wide, between words. Without microjustification, when you print right-justified text, the printer will insert two full spaces between some words and only one space in between others.

Unfortunately, this feature is exceedingly slow. A line of type that my Epson normally prints in about 1.5 seconds takes 20 seconds with *NewWord*'s microjustification. But you can turn the microjustification on and off with a dot command, and you can run *NewWord*'s install program to keep it off unless specifically requested. It's there when you want it, but it doesn't need to bother you if you'd rather do without it.

Dot matrix printer owners will also be happy to discover that they can invoke built-in fonts such as condensed type or double-width type using *NewWord*'s character-width dot command. In *WordStar* this command, .CW, simply controls the spacing between letters. In *NewWord* it



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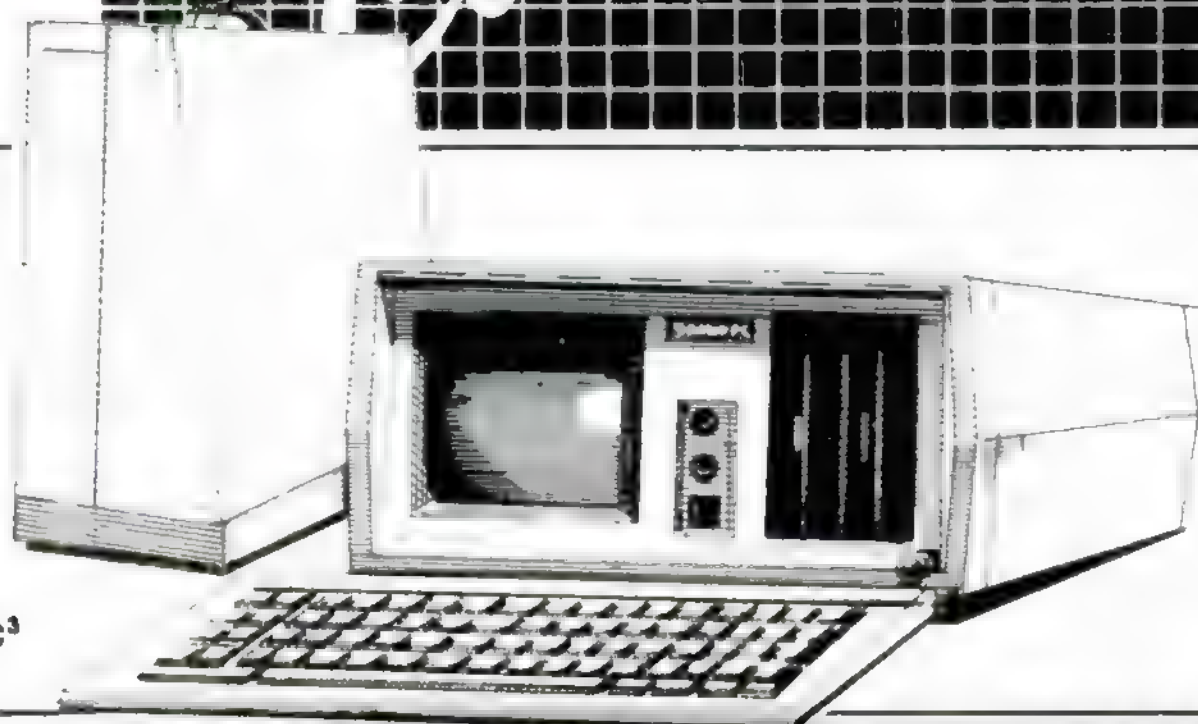
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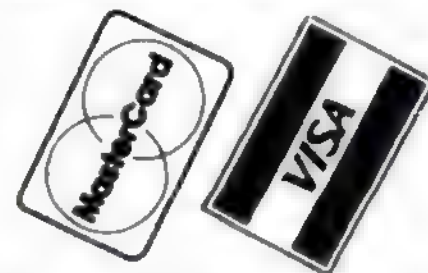
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## NEWWORD

also controls the Epson's typefaces. The command .CW7 will give you condensed type; .CW12 gives normal type. You can also get intervening widths, although the printer will slow down quite a bit because it will use *NewWord's* microjustification technique to space out the letters in a non-standard way.

### Inherited Failings

While *NewWord* is a powerful program with lots of features, it's not without problems. Because it so closely resembles *WordStar*, it has most of *WordStar's* failings. Its complicated command structure is difficult to learn, although thousands of dedicated *WordStar* fans contend that once you learn it, it's easy to use. Although that might be a worthwhile trade-off for people who use the program every day, if you write only occasionally you'd probably be better off with a word processor that's easier to learn.

*NewWord's* manual does address this problem to some extent. Its well-written tutorial covers most of the program's features and compares favorably with some of the teach-yourself-*WordStar* books now on the market. The manual sometimes tries too hard to be cute; for example, when it discusses the creation of customized form letters it snickers, "Now that you have *NewWord*, you can misspell the names of thousands of innocent people, too." But it gets the job done, and too cute is better than too dull.

The manual has another, more serious defect. As was common 2 years ago when software publishers were racing to make their 8-bit programs run on the PC, *NewWord* does not come with a PC specific manual. Instead, the manual describes the CP/M version of *NewWord* and comes with a 23-page PC supplement entitled "Read Me First."

While this approach has advantages for manufacturers (they don't have to rewrite the manual), it takes its toll in confusion and frustration on the poor PC user. The manual describes program features that don't exist in the PC version while

neglecting to explain some features that do. I spent quite a bit of time trying to figure out how to assign "user numbers" to my documents before I discovered that this feature is available only on the CP/M model. I also had a hard time getting one of *NewWord's* custom fonts to invoke the italic font on my printer, because the manual lacked specific instructions. I finally succeeded after conferring by phone with a technical representative at Rocky Mountain Software and with Stan Reynolds at

gam—is entirely bug-free, and that's why good support is an important part of a software purchase. Rocky Mountain Software offers free telephone support for the first 90 days after your purchase. If you want additional telephone support after that, you can pay an hourly rate of \$45 per hour with 1-hour minimum units, or purchase a telephone support contract for \$50 per month. If that's too high for you, you can still get answers to your questions by mail during the first year after your purchase.

Operation or Feature	<i>WordStar</i> Command	<i>NewWord</i> Command
Change logged disk drive	L	L
File directory ON/OFF	F	F
Set help level	H	J
Open a document file	D	D
Open a non-document file	N	N
Print a file	P	P
Go to Help menu	^J	^J
Insert carriage return	^N	Enter
Mark/unmark block beginning	^KB	^KB
Copy block	^KC	^KC
Subscript	^PV	^PV
Find and replace text	^QA	^QA
Line height	.LH	.LH
Output justification	.OJ	.OJ

This sampling of commands in *WordStar* and *NewWord* illustrates the similarities between the two programs' command structures.

### NewStar.

I also ran into the odd bug here and there. When I tried to get page numbers to print on the far left-hand side of a page using the .PC1 command, *NewWord* refused to print my text. More seriously, I found that whenever I tried to move or copy more than a screenful of text, *NewWord* garbled the result, placing some paragraphs in the wrong order and throwing others out of alignment. When I reported this problem to the folks at NewStar, they said they couldn't duplicate the bug on their equipment, but they offered to look at a copy of my file to try to determine what was wrong.

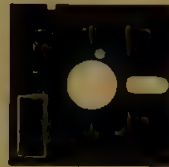
### Support System

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All in all, *NewWord* stacks up well against *WordStar* and, by extension, with other top-of-the-line word processing programs. Alan Tan, director of marketing and communications for Rocky Mountain Software Systems, predicts that once the public discovers *NewWord*, the program will take most of the personal computer word processing market away from the long-reigning *WordStar*. That sounds as likely as the possibility that the Corona PC will steal the IBM PC's share of the personal computer market.

But like the Corona and other PC compatibles, *NewWord* will probably find a healthy market among budget-conscious consumers who want the power of a big name product without spending big bucks. ■

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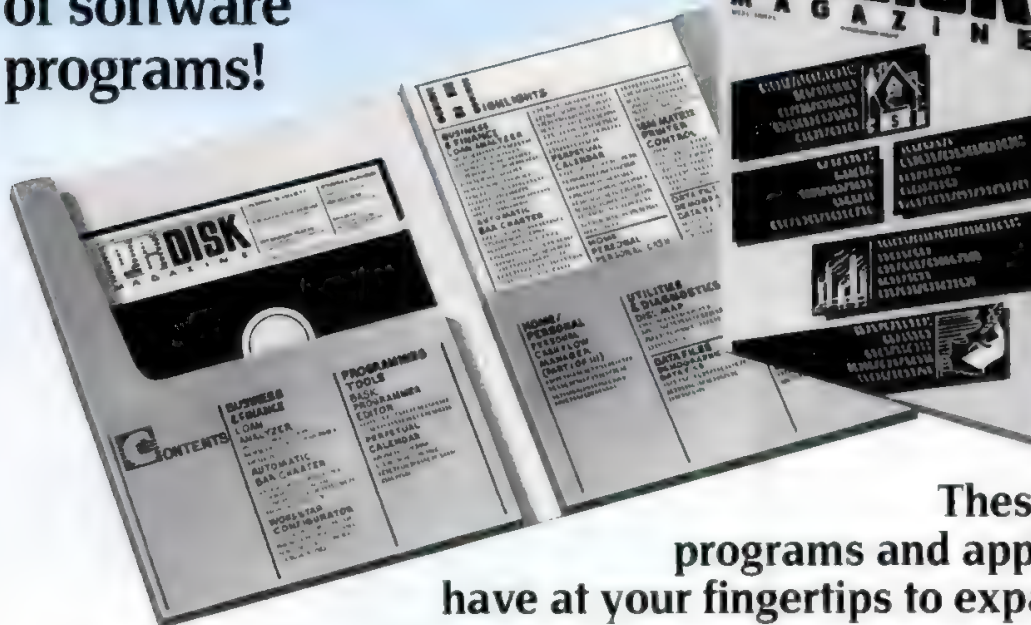
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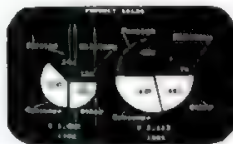
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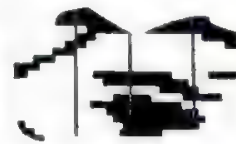
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through July 31, 1984

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- TK! Solver . . . . .
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85.

85.

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- How to use Multiplan . . . . .
- How to use Your IBM-PC . . . . .
- How to use MultiMate . . . . .
- How to use Microsoft Word . . . . .
- How to use PC DOS . . . . .
- How to use TK! Solver . . . . .

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- Typing Instructor . . . . .

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47.

75.

47.

39.

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- Great graphics and sound
- My Letters, Numbers, & Words (ages 1 to 5) . . . . .
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29

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22

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- Dig Dug . . . . .
- Defender . . . . .
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- Hoser . . . . .

25

### Broderbund

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- Lode Runner . . . . .

23

25

### EPYX/Automated Simulations

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23

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23

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35.

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29

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27

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42.

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29

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- SixPakPlus 64k upgradeable to 384k, with clock calendar, serial and parallel ports (game port optional) . . . . .

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## PC Connection Hardware Special through July 31, 1984

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For the IBM-PC Exclusively.  
 CIRCLE 339 ON READER SERVICE CARD

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All drives are completely pre-tested. Specify Drive A or Drive B for your PC. Comes with complete step by step installation instructions. Drives are 320K/360K.

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## TEAC

FD-55B (5 1/4") half-height drive (DS,DD)  
 Free 'y' cable & bracket with each pair  
 ..... see special

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 Install memory upgrades & run diagnostics at time of board purchase only ..... 10.

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# Mom™ works best with CICS, TSO, & CMS.

PC/COM™ Provides Full File Management From Micros to Mainframes.

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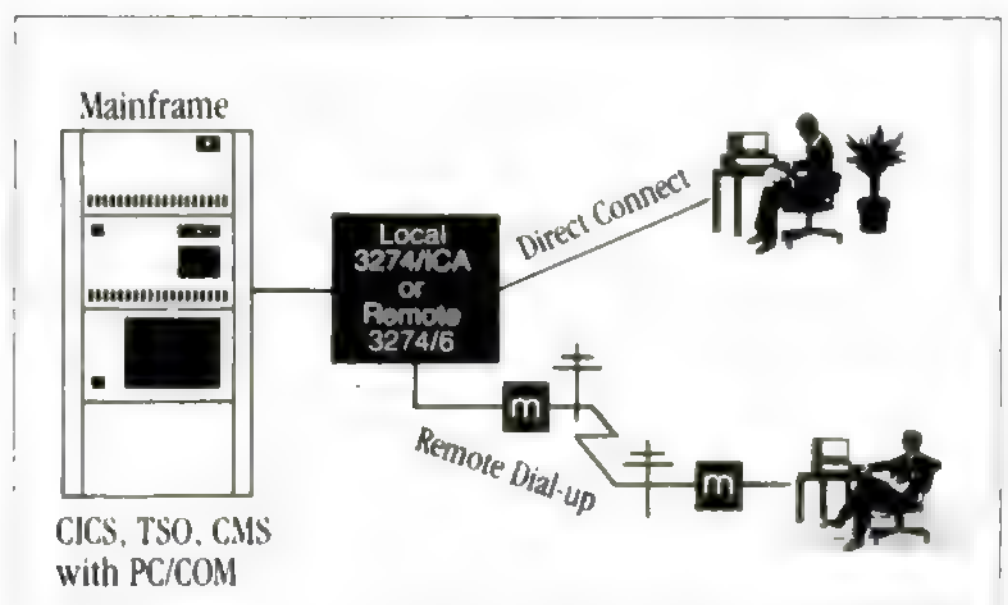
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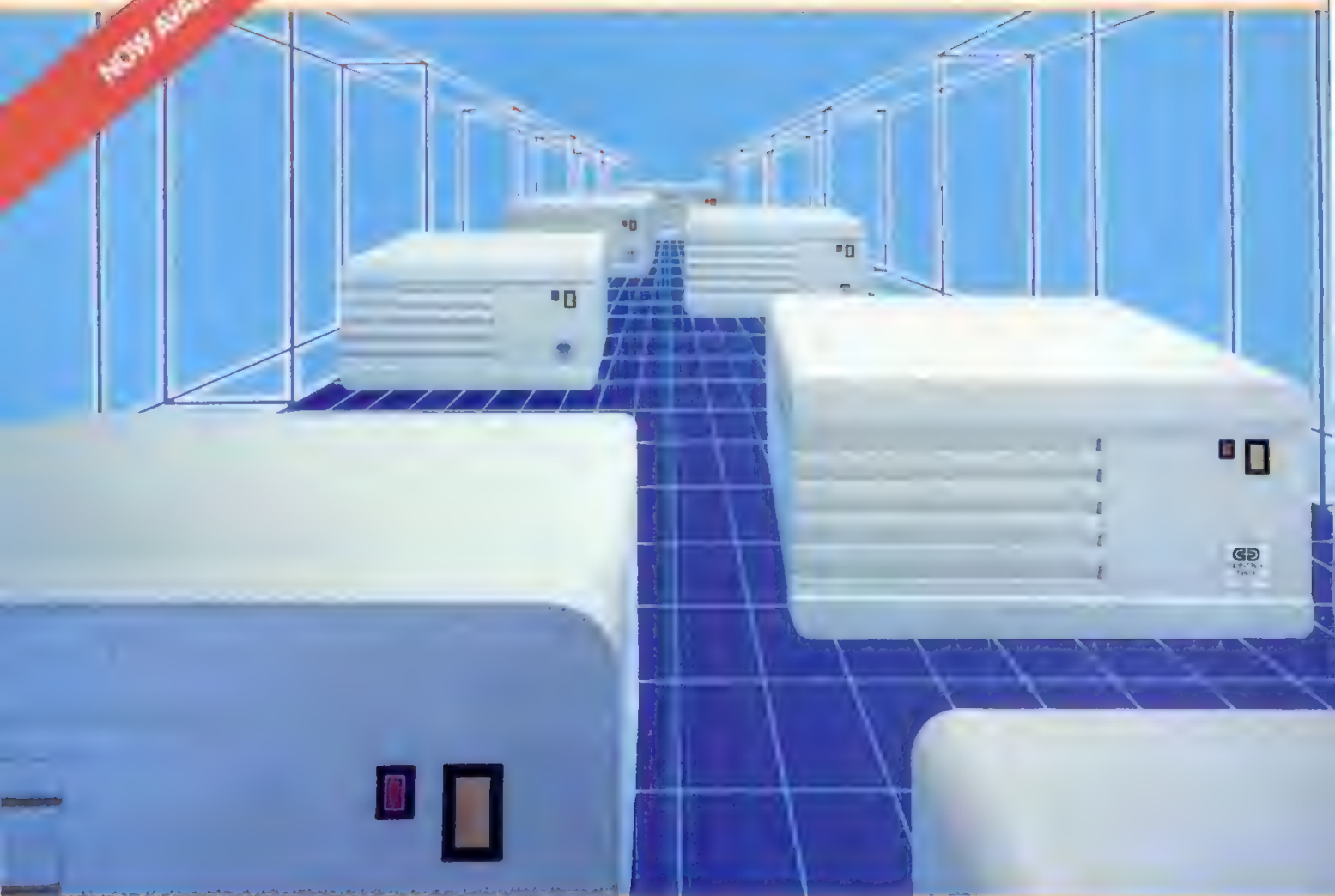
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## StorageMaster™ Fixed Disk builds stronger PCs three ways.

If you own an IBM PC, the new StorageMaster 500 Series Fixed Drives from Control Data give you three great advantages.

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- More byte for the buck. Dollar for dollar, StorageMaster gives you more bytes of storage than IBM's fixed disk drive.

There's more. The 500 Series Drives have an average seek time of only 45 milliseconds—about twice as fast as most other drives. They store your information in a sealed, contamination-free environment. They require no cleaning or preventive maintenance. And they

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**GD**  
CONTROL  
DATA

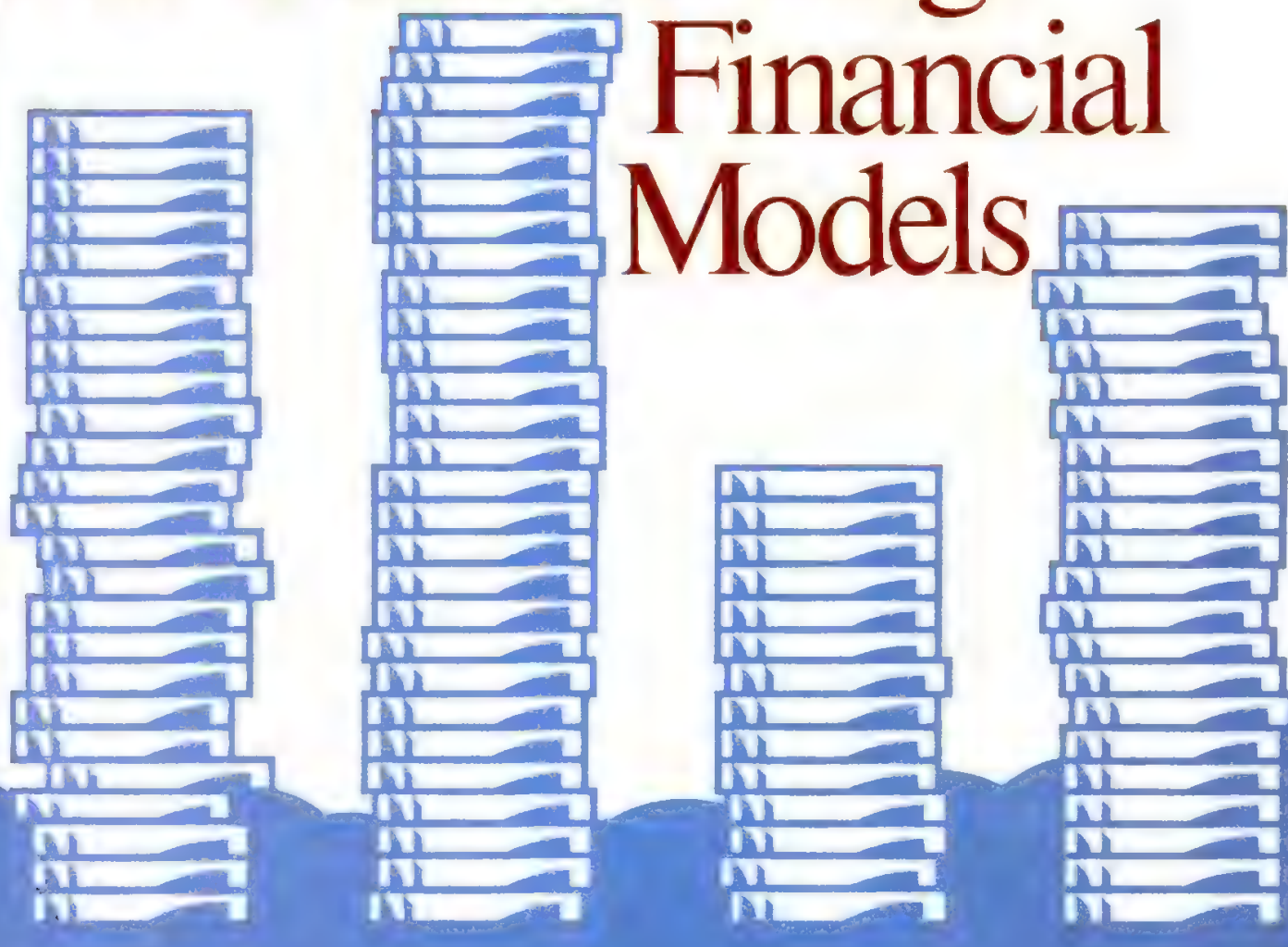


# NEW POWER

Financial modeling languages, such as Ferox Microsystems' ENCORE! package, are newly available for the PC.

They can perform financial analysis tasks too complex for spreadsheets.

## For Constructing Financial Models





PELAVIT



## ENCORE!

**C**orporate financial managers often need to create financial models for planning, analyzing alternatives, budgeting resources, and measuring profitability. These models simulate reality—the company and its structure—in economic terms and can be manipulated to answer “what-if” questions about the company’s future actions.

Although sophisticated software for financial modeling, which is often written in special financial modeling languages, has long been available for mainframe computers, the only available software for performing this task on the PC has been spreadsheets. No matter how sophisticated, spreadsheets can perform only a limited amount of financial modeling. Now, however, down-sized versions of mainframe financial modeling languages are being marketed for the PC. One such package is *ENCORE!* by Ferox Microsystems, Inc., a sophisticated and capable product that has most of the features typically found in a mainframe financial modeling language.

### Compare and Contrast

Because financial modeling languages for the PC are so new, you need to take the time to understand the differences between these languages and spreadsheets before you can decide whether you need such a package for your analyses.

One major difference is in the complexity of problems each can handle. Consider the following analogy. Suppose you are a contractor. When you start a new house, you choose a steamshovel to help you



### **ENCORE!**

Ferox Microsystems, Inc.  
1701 N. Fort Meyer Dr., #611  
Arlington, VA 22209  
(703) 841-0800

List Price: \$695

Requires: 256K RAM, two double-sided disk drives or hard disk.

CIRCLE 744 ON READER SERVICE CARD

Variables	This Year	<-----Forecast Years----->
Units Sold		Data as projected
Price		Data as projected
Sales (\$M)		Units Sold × Price
Gross Profit		Sales—Cost of Sales
Profit Before Tax		Gross Profit—Administrative Expenses
Net Profit		Profit Before Tax—Estimated Taxes
Margin (%)		Net Profit as a Percent of Sales
Notes:		
Cost of Sales		A Percentage of Sales—(use 67%)
Administrative Expenses		Increasing from “This Year” with Inflation at 10% (next year) and 12% thereafter
Estimated Taxes		Use the Standard U.S. Tax Tables for Corporations

Figure 1. Sample notes for a model for a 5-year profitability plan.

clear the land and dig the basement. On the other hand, if you need to move a couple of cubic feet of dirt from a truck bed to your flower garden, you choose a shovel. It’s easy in these extreme cases to pick the right tool for the job, but when the level of effort falls somewhere between two such extremes, you have to take more factors into consideration. You consider the time and expense tradeoff between using the steamshovel and the shovel. You also consider the time and effort it will take to learn to use the steamshovel. After all, you already know how to use the shovel!

If you need to develop a production financial modeling application that involves a complete 5-year financial plan showing the integrated financial statements for each of 45 departments within seven divisions and, finally, the consolidated financial plan for a corporation with \$200,000,000 in assets, then a financial modeling language would probably be the best software package to use.

On the other hand, if you are comparing the 4-year operating costs of car A and car B and you need only vary a few simple assumptions—say the loan interest rate and each car’s miles per gallon—a spread-

sheet will be faster and more efficient.

Another important difference between the two types of programs is in the way in which you describe the model to the computer. For example, either a spreadsheet or a financial modeling language could be used to describe and solve the simple financial model sketched out in Figure 1. With a spreadsheet, you would set up this model as shown in Figure 2 and describe the Gross Profit variable as follows: move the cursor to the spreadsheet cell at the intersection of the column labeled This Year (column B) and the row labeled Gross Profit (row 5). Enter the year’s Gross Profit figure. Then you move the cursor (in the same row) to column C (the first year of the forecast) and insert a formula along the lines of C4 = C3–C9 to describe the relationship between Gross Profit, Sales, and Cost of Sales. You move the cursor to column D and copy the formula into the remaining columns representing the forecast years.

To describe the same formula to the computer using the financial modeling language, you type:

'GROSS PROFIT' =



## 'SALES' - 'COST OF SALES'

As you can see, the financial modeling expression of Gross Profit is much closer to its English equivalent than the spreadsheet expression. In fact, the definition of an entire model in a financial modeling language looks similar to the way you might define the problem on paper. Figure 3 shows how the worksheet model in Figure 1 is described to the computer using *ENCORE!*

The way you describe the problem to the computer is the most immediately noticeable difference between spreadsheets and true financial modeling languages. The difference in their abilities to handle complex problems may not become obvious until you reach the point in developing an application where you begin to stretch the limits of the spreadsheet. For instance, you may need to consolidate several divisions into the corporate 5-year plan while taking into account several interdivision transfers. You realize that with the spreadsheet, you have no easy way to perform the consolidation and still include the financial allocations among divisions. Here, a financial modeling language will become useful.

Several features are available in financial modeling languages not found in most spreadsheets. Lotus' *Symphony* and Ash-

ton-Tate's *Framework* have more capabilities than many present-day spreadsheets, but even these powerful integrated programs do not offer all the features standard in a full-blown financial modeling system. Some of the features that distinguish financial modeling languages from spreadsheets are:

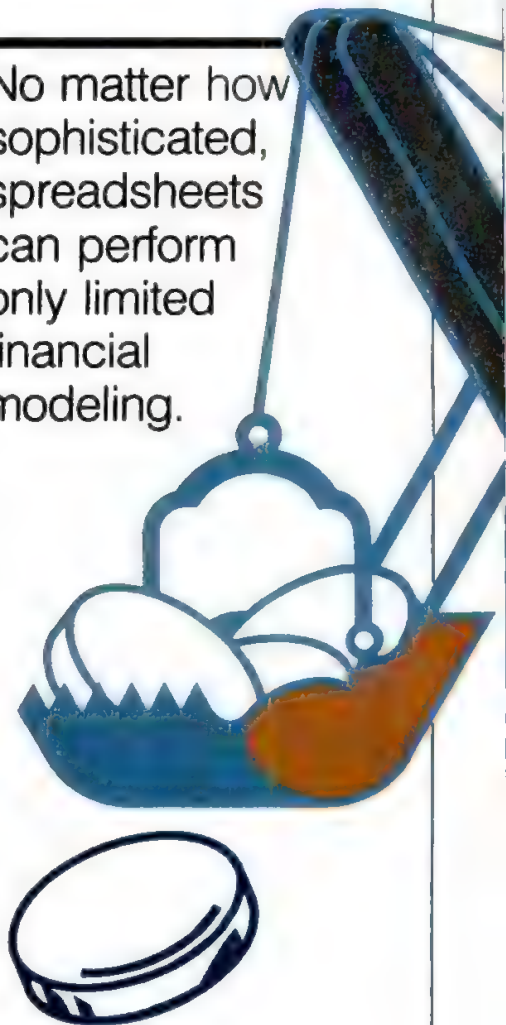
- **Simultaneous equations.** All financial modeling languages should have the ability to solve simultaneous equations. The equation

$$X = e^{-x}$$

(where  $e$  is the constant 2.718 . . .) is a simple example of a simultaneous equation. The only way this can be solved is through a series of recursive iterations using trial substitutions to search for the value of  $x$  that makes the equation true. (The only product on the market now other than financial modeling languages that can solve simultaneous equations is Software Arts' *TK! Solver*.)

An example of a frequent "real world" use for simultaneous equations occurs in an integrated income statement and balance sheet model. Profits from the income statement and interest expense on short-term debt are passed, respectively, to the asset and liability sides of the balance sheet. A set of recursive and iterative equations must be processed to get share-

No matter how sophisticated, spreadsheets can perform only limited financial modeling.



A20:

READY

	A	B	C	D	E	F
		This Year	1985	1986	1987	1988
1	VARIABLES					
2	Units Sold					
3	Price					
4	Sales (\$M)					
5	Gross Profit					
6	Profit Before Tax					
7	Net Profit					
8	Margin(%)					
9	Cost of Sales					
10	Administrative Expenses					
11	Estimated Taxes					

Figure 2: The Figure 1 model laid out as a spreadsheet.



## ENCORE!

holder's equity plus assets to equal total liabilities while maintaining the relationships of all the variables in the other balance sheet equations. Equations of this type occur in financial models more often than you might think, and you'll need the power of a modeling language to deal with these interrelated equations and relationships among variables. Spreadsheets can not easily handle this task.

● **Command files.** If you perform the same analysis for new data each month and produce the same reports, it is helpful to have a command file to store the key-strokes (or commands). Financial modeling languages have extensive command file capabilities. For instance, you may need each month to allocate data processing expenses to each corporate division based on factors that accumulate to each division throughout the month, such as training courses and materials supplied, number of PCs installed, consulting hours spent by corporate data processing personnel, and central processing units used on the corporate mainframe. With a financial modeling language command file you can develop a procedure to allocate the corporate data processing expenses for the month according to the factors collected by division. This procedure can then be used over and over each month to perform the proper interdivision transfers to allocate the data processing expenses fairly to the divisions using these services.

This financial application would be difficult to construct using most spreadsheets. Lotus' 1-2-3 has a macro facility that partially addresses this shortcoming, but 1-2-3's macro language is rather cryptic and difficult to set up for a complex production analysis.

● **Extensive built-in functions.** Many built-in mathematical, statistical, and financial functions are included as standard routines in financial modeling languages. Some examples include loan amortization, tax loss carry-forward analyses, accelerated cost recovery system (ACRS) depreciation, non-ACRS depreciation, internal rate of return, net present value, and

```

INPUT 'UNITS SOLD' = 780,835,895,950,1020,1200
INPUT 'PRICE' = 10,11,12,14,15,17
  'SALES' = 'UNITS SOLD' * 'PRICE'
  'COST OF SALES' = 0.67 * 'SALES'
  'GROSS PROFIT' = 'SALES' - 'COST OF SALES'
INPUT 'ADMINISTRATIVE EXPENSES' = 725,10%,*12%
  'PROFIT BEFORE TAX' = 'GROSS PROFIT' - 'ADMINISTRATIVE EXPENSES'
  'ESTIMATED TAXES' = 'PROFIT BEFORE TAX' * TAX 5.0
  'NET PROFIT' = 'PROFIT BEFORE TAX' - 'ESTIMATED TAXES'
  'OPERATING MARGIN' = 'NET PROFIT' / 'SALES'

```

Figure 3: Description of the Figure 1 model using ENCORE!

Demo Report Using ENCORE!					
XYZ Corporation					
September 31, 1983					
1		2	3	(000) 4	5
	<b>REVENUES</b>				
\$ 2,500	SALES	\$ 2,750	\$ 3,162	\$ 3,637	\$ 4,182
1,650	COST OF SALES	908	949	1,091	1,255
	<b>GROSS PROFIT</b>	<b>1,843</b>	<b>2,214</b>	<b>2,546</b>	<b>2,928</b>
	<b>EXPENSES</b>				
375	DEPRECIATION	700	820	845	840
100	SALARIES	112	125	140	157
375	COMMISSIONS	413	474	546	627
45	ADVERTISING	51	51	54	57
278	OVERHEAD EXPENSES	292	306	322	338
23	OFFICE SUPPLIES	23	23	23	23
100	MISCELLANEOUS	110	121	133	146
	<b>TOTAL EXPENSES</b>	<b>1,697</b>	<b>1,921</b>	<b>2,063</b>	<b>2,189</b>
	<b>PROFIT</b>				
354	NET PROFIT BEFORE TAX	145	293	483	739
53	CORPORATE TAX	22	44	72	111
	<b>NET PROFIT AFTER TAX</b>	<b>\$ 124</b>	<b>\$ 249</b>	<b>\$ 411</b>	<b>\$ 628</b>
A - THIS IS OUR TARGET NET PROFIT AFTER WE CONSIDERED ALL OF THE NECESSARY GAAP PROCEDURES ETC, ETC,					
	<b>ANALYSIS</b>				
(1,824)A	NET CASH FLOW	(176)	569	1,256	1,468
516A	NET PRESENT VALUE	-	-	-	-
27.95%	INTERNAL RATE OF RETU	-	-	-	-

Figure 4: Profit planning report produced by ENCORE! for XYZ Corporation showing Net Profit Before Tax with initial assumptions.

statistical regression. These built-in functions allow you to spend your time using their results rather than developing the logic for them in the body of a spreadsheet.

● **Goal seeking.** All spreadsheets allow you to ask "what-if" questions by changing the data and recalculating. But what if

you want to ask a "what-if" question "backwards"? Say, for example, you want to know what level of sales you need to make a certain amount of profit. A spreadsheet can only compute the bottom line profit figure based on an assumed sales level. It can't take a target figure for profit and try different sales figures until it

reaches that target. This backwards "what-if" question is called goal seeking; financial modeling languages perform this type of analysis routinely.

## ENCORE!

*ENCORE!* is one of the first software products to bring these mainframe financial modeling language capabilities to the IBM PC. It is a capable program that will solve extensive financial models without running out of steam. Besides its financial modeling logic, *ENCORE!* includes a spreadsheet, an editor, a command file processor, and built-in file-handling utilities. *ENCORE!*'s greatest advantage over a spreadsheet is realized only in complex production financial problems. Its extensive command file capability, called EXEC!, allows it to take on complex financial data processing applications. Its only practical limitation is the size of your PC's memory and disk storage. With *ENCORE!*'s EXEC! system, you can set up practically any monthly financial production system as a menu-driven application that anyone could run.

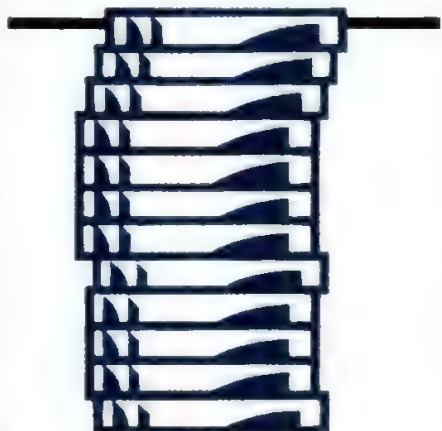
*ENCORE!*'s second advantage over a spreadsheet is its English-language model syntax. You describe the model in natural-looking syntax similar to what you would use in defining the problem to your data processing department (see Figure 2). This syntax can be a valuable asset. The English-language description substantially reduces the learning curve the second time you develop a model. The syntax can be printed out for viewing, and you can use modeling techniques from previous models again. A description of the spreadsheet logic used is much more cryptic looking than the same model written in *ENCORE!*

I was particularly impressed with how easily *ENCORE!* performs goal-seeking analysis. Here's an example that shows how the goal-seeking feature works.

Figure 4 shows a report from an *ENCORE!* model for a 5-year plan using an initial set of assumptions about the planned revenue projections. In particular,

note the Sales and the Net Profit Before Tax figures.

Suppose you are the owner of XYZ Corporation (see its profit plan in Figure 4.) You want your plan to show a break-even figure for the first year (Net Profit Before Tax = 0 in column 1) with the following profit before tax figures for the remaining years: year 2= \$100,000, year



**ENCORE! has extensive reporting capabilities that allow you to format any report you might need.**

3= \$500,000, year 4= \$1,000,000 and year 5= \$1,500,000. (Note that figures are shown in thousands in the report.) You want the answer to the question, What sales revenues would we need in years 1 through 5 to achieve our Net Profit Before Tax goals in the first 5 years?

Figure 5 shows what appears on the display screen when the first iteration and the last (third) iteration of *ENCORE!*'s goal-seeking analysis are complete. It took only three iterations through the model for *ENCORE!* to solve for all 5 target years for Net Profit Before Tax. The third iteration shows the sales figures needed to generate the corresponding profit figures in each of the first 5 years. (Sales for year 1=

\$1,805,900, year 2= \$2,662,700, year 3= \$3,539,100, year 4= \$4,576,400, and year 5= \$5,566,300. Year 6 is also computed in the model but not shown on the reports.)

Figure 6 shows the full report with the profit targets and the sales required to reach those targets. Note that all other relationships still hold true in each report even though the sales and profit figures are different. For instance, the equation Net Profit Before Tax = Gross Profit - Total Expenses is still true in each report, although the figures used to calculate them have obviously changed.

*ENCORE!* has extensive reporting capabilities that allow you to format any report you might need. The report writer is straightforward and easy to use. The package also produces good graphics. It will make line graphs, pie charts, and side-by-side and stacked bar charts. You can annotate the graphs by placing comments anywhere that you need to. The comments can be enclosed in a box to highlight them if necessary. Screen graphs can be reproduced on the IBM dot matrix printer or an Epson printer with the Grafrax option.

Graphs sent to the dot matrix printer are produced by using the Shift-PrtSc key combination. Unfortunately, the resolution that results from using this approach is not as good as the resolution you achieve with 1-2-3's printer graphics. However, *ENCORE!* also supports pen plotters such as the Hewlett-Packard 7400 series and the 7200 series plotters, on which the graph resolution is much better.

## On the Negative Side

*ENCORE!* does have some drawbacks. My biggest objection is that it is Pascal based. I have never seen a program written in Pascal that runs at a decent speed. It takes an unnecessarily long time to boot up *ENCORE!*, select the spreadsheet module, and load a short model (2¼ minutes). This may or may not seem like a long time to you, but if you have to do it several times each day, you do get tired of listening to your system "bump and grind" as it



# ENCORE!

loads up *ENCORE!* It also takes a long time to move from one module of the system to the other.

For instance, using the model shown in Figure 3, it took 2½ minutes to move out of the spreadsheet module, make a change in model logic with the editor, return to the spreadsheet, and load and recalculate the model using the new logic. (In all fairness to *ENCORE!*, you can make some temporary model logic changes "on the fly" without having to leave the spreadsheet and enter the editor.)

Pascal-based systems cause a multitude of problems for IBM PC users. For example, *ENCORE!* has a reasonably good built-in editor, but I already know how to use a perfectly good DOS-based editor. I

One minor *ENCORE!* irritant is the quotation marks required around all the variables used in the model.

can't use the DOS editor with *ENCORE!*, because the program uses Pascal disk formatting. If you really need to use it, *ENCORE!* does have a way to transport DOS files to Pascal and vice versa. In general, however, *ENCORE!* is a fine finan-

cial modeling package. I hope Ferox will consider rewriting the program in a DOS-compatible language.

## Not Nonprocedural

Another *ENCORE!* drawback is that it is not a nonprocedural language. A nonprocedural modeling language allows you to describe the model to the computer in any equation or variable sequence you like. The computer will then locate all the variables (as long as they are defined *somewhere* in the model) and compute all model equations correctly. Consequently, with a nonprocedural modeling language you don't have to worry about the order in which the model logic appears. You can concentrate on the relationships of the variables in the model and make sure the logic is correct.

Since *ENCORE!* is procedural, you have to define a variable used in an equation before the equation using that variable appears in the model. For instance, the notes at the bottom of the model definition in Figure 1 concerning the assumptions about inflation, cost of goods sold, and administrative expenses had to be moved up to the appropriate places in the model logic (see Figure 3). The *ENCORE!* model did not produce accurate answers when the definitions of these variables were left as notes at the end of the model (as shown in Figure 1).

Also, if you are constructing a model with *ENCORE!* that has a simultaneous equation somewhere in it, you must use programming techniques such as DO loops and DOWHILE statements similar to those found in BASIC and FORTRAN. With nonprocedural languages, learning these programming techniques is not necessary for using simultaneous equations.

One minor irritant is the quotation marks required around all the variables used in the model (see Figure 3). I left one off once and got an error message when I tried to compile the model. The error message said future versions of *ENCORE!* would not require you to enclose the variables in quotation marks. I am glad to see

*** Goal Seeking... SCOREBOARD Iteration #1									
Targets found so far: 0 out of 6									
Variable		Target		How					
SALES		NET PROFIT BEFORE TAX		Far					
Column	Value	Column	Value	Goal	Off	0%	..	100%	
1.....	2,500.0	31.....	354.0	0.0	354.0	[[[[[[[[[[			
2.....	2,750.0	32.....	145.4	100.0	45.4%	[[[			
3.....	3,162.5	33.....	292.9	500.0	(41.4)%	[[			
4.....	3,636.9	34.....	483.3	1,000.0	(51.7)%	[[			
5.....	4,182.4	35.....	738.8	1,500.0	(50.7)%	[[			
6.....	4,809.8	36.....	1,555.1	2,000.0	(22.2)%	[			

*** Goal Seeking... SCOREBOARD Iteration #3									
Targets found so far: 6 out of 6									
Variable		Target		How					
SALES		NET PROFIT BEFORE TAX		Far					
Column	Value	Column	Value	Goal	Off	0%	..	100%	
1.....	1,805.9	31.....	0.0	0.0	0.0				
2.....	2,662.7	32.....	100.0	100.0	0.0%				
3.....	3,539.1	33.....	500.0	500.0	0.0%				
4.....	4,576.4	34.....	1,000.0	1,000.0	0.0%				
5.....	5,566.3	35.....	1,500.0	1,500.0	0.0%				
6.....	5,618.7	36.....	2,000.0	2,000.0	0.0%				

All targets found! Press <spacebar> to continue -->

Figure 5: *ENCORE!* goal-seeking results after the first and third iterations.

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### Demo Report Using ENCORE!

XYZ Corporation

September 31, 1983

1		2	3	(000) 4	5
	REVENUES				
\$ 1,806	SALES	\$ 2,663	\$ 3,539	\$ 4,576	\$ 5,566
614	COST OF SALES	879	1,062	1,373	1,670
1,192	GROSS PROFIT	1,784	2,477	3,203	3,896
	EXPENSES				
375	DEPRECIATION	700	820	845	840
100	SALARIES	112	125	140	157
271	COMMISSIONS	399	531	686	835
45	ADVERTISING	48	51	54	57
278	OVERHEAD EXPENSES	292	306	322	338
23	OFFICE SUPPLIES	23	23	23	23
100	MISCELLANEOUS	110	121	133	146
1,192	TOTAL EXPENSES	1,684	1,977	2,203	2,396
	PROFIT				
0	NET PROFIT BEFORE TAX	100	500	1,000	1,500
0	CORPORATE TAX	15	75	150	225
0	NET PROFIT AFTER TAX	\$ 85	\$ 425	\$ 850	\$ 1,275
*****					
A - THIS IS OUR TARGET NET PROFIT AFTER WE CONSIDERED ALL OF THE NECESSARY GAAP PROCEDURES ETC, ETC,					
	ANALYSIS				
(2,125)A	NET CASH FLOW	(215)	745	1,695	2,115
1,024A	NET PRESENT VALUE	-	-	-	-
32.96%	INTERNAL RATE OF RETU	-	-	-	-

Figure 6: Profit planning report produced by ENCORE! for XYZ Corporation after setting goal-seeking targets for Net Profit Before Tax.

that Ferox is addressing this point.

ENCORE's well-written manual is over 700 pages long and gives many good examples. One of its first pages also lists a phone number you can call anytime from 9 a.m. to 6 p.m. Eastern time to ask questions about the correct operation of ENCORE! Ferox promises to answer as many questions as you have and does not charge for the service. The company also offers 2-day classes (for a fee currently set at \$400) to all interested users.

### Conclusions

Financial modeling languages should not be used for all spreadsheetlike problems. They are most useful for the more

extensive financial modeling problems usually found in medium- to large-sized businesses. If you think the application you are about to start might need a fairly complex financial model to adequately represent "reality," then it's possible that your spreadsheet might not be up to handling it. Of course, on the other hand, you shouldn't buy a steam shovel to do the work of a trowel.

If you are responsible for financial planning in any business, you will probably need both a spreadsheet and a good financial modeling language. If you do investigate financial modeling languages, ENCORE! is one package you should consider.



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# Better Business BASIC

**N**ot too long ago, I wrote an introduction to Business BASIC and reviewed a Business BASIC interpreter from Control-C Software (see "Doing Business with BASIC," *PC*, Volume 3 Number 1). As often happens in the microcomputer market, new products have since come along and eclipsed the older one. The two new Business BASIC interpreters at hand have dramatic advantages over the Control-C product, yet each has a very different philosophy behind it. It is hard to believe that two such similar versions of a language interpreter can be implemented in such different ways, yet this is the case with Applications BASIC from Soft Gold, Inc., and SMC's Thoroughbred BASIC. Programmers may see them as peas in a pod, but to end users they are as different as jelly beans and chick-peas.

## Hail Business BASIC

You may be wondering just what Business BASIC is and how it differs from Microsoft BASIC. Business BASIC was developed by Basic Four Corporation in 1968 as an operating system cum language for its minicomputers. The philosophy of

The two Business BASIC interpreters reviewed here are very similar in programming terms, but the packages provide two very different implementations of one versatile language.

the developers was that the average user has no computer background and doesn't want an "educational experience" thrust upon him. Better yet, they assumed that programmers who were implementing commercial applications wanted a powerful yet simple commercial language. As Einstein put it, "Keep it simple, but no simpler." Business BASIC, like no other language, manages to do just that.

Business BASIC was developed nearly 10 years before Microsoft BASIC, and it is a far better and more powerful commercial language. I emphasize the word "commercial" because the language was designed for applications that are used in the everyday world of accounting and running a business. It won't do graphics, and it won't let you poke around to achieve animated accounts receivable. However, it employs decimal arithmetic, just like you, me, and the common adding machine. Business BASIC also supports keyed files (so, for example, you can write records to a disk file alphabetically) and its string handling is much more powerful than COBOL's or Microsoft BASIC's capabilities. Business BASIC also uses mnemonics for printing to printers or the CRT screen. Thus, CS will clear the screen, while EP might be used for expanded print on a printer. These mnemonics are defined once in a table and are then available to all programs that need to use them—any machine-dependent features are in the table, not in the programs.

Business BASIC is also tremendously transportable. You can't muck around



## BUSINESS BASIC

with machine-dependent features very easily. This amounts to a form of self-protection for 99 percent of all users. (For those who like mucking around, my sug-

gestion is to program in C or Assembler.) Besides, since Business BASIC arose from a single original source, all later versions look pretty similar. Everyone eyed

Basic Four's user base hungrily, and it's easier to get converts to your machine if it's painless for the users-to-be.

To avoid any confusion, I must note that I am not talking about what Microsoft calls "Business BASIC." That product has limited business capabilities and exists only as a compiler (which is unfortunate). In any environment, BASIC's greatest strength is that interpretive code is easy to develop and maintain. Don't confuse the products reviewed here with Microsoft's.

Having made my speech about how Business BASIC is the best thing since sliced cheese, let me burst my own balloon. It's extremely good for business applications and, oddly enough, is a marvelous language for disk utilities—it can read any sector on a disk including directories and file allocation tables. But it's dreadful for graphics. There are none. It's also not an ideal language for teen-agers, who will find Microsoft BASIC more general, Logo more fun, and APL more terse. Nor is it any good for scientists. It can't find a cosine any more than a computer can mow the lawn. But for most applica-



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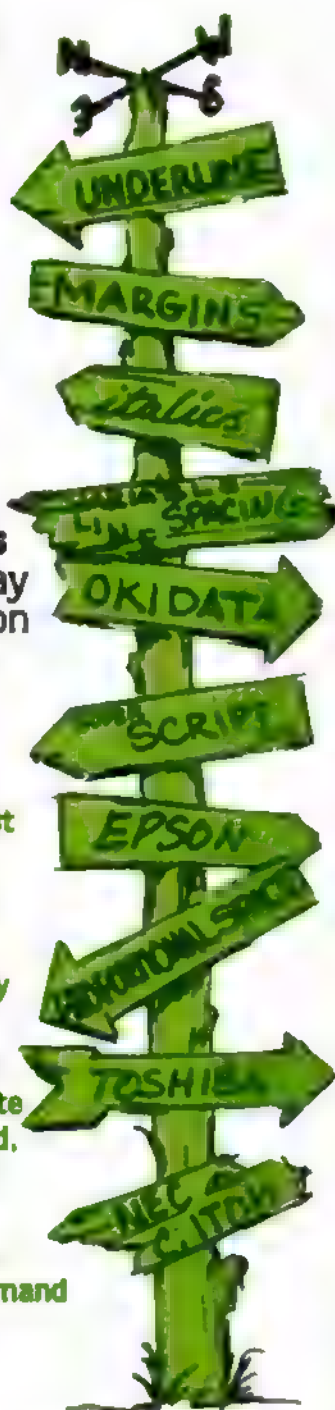


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## BUSINESS BASIC

tions for the IBM PC—including home budget managers, general ledgers, manufacturing systems, and other applications in the world of commercial data processing—nothing can touch Business BASIC,

For applications in commercial data processing, nothing can touch Business BASIC—not even the best implementations of COBOL.

not even the best implementations of COBOL.

Let's look at Applications BASIC and Thoroughbred BASIC in turn.

### Soft Gold's Applications BASIC

Soft Gold is a new company. Applications BASIC—or AB86, as Soft Gold labels it—is the brainchild of Dick Wallman, who has been working on Business BASIC products ever since Basic Four developed the language in the late sixties. He previously had written versions for other companies, and his years of experience writing BASIC interpreters shows in this one. Applications BASIC is a very small (about 22K) and very efficient product. It has many little features that professional programmers appreciate.

Applications BASIC was written in an impressively short time, but it is a full BBIII-compatible implementation. (BBIII is a version of Basic Four's product; its features are to Business BASIC what Level II is to COBOL.)

Applications BASIC is designed to run under MS-DOS. In fact, it may be the most MS-DOS-compatible product I have ever seen. It does not cheat. It never yields to the temptation to use the IBM ROM BIOS. The ROM BIOS is a very power-

ful, but machine-dependent, set of routines. MS-DOS has routines that hide these dependencies. If you stick to MS-DOS routines, your software will run as well on a Texas Instruments PC or a DEC Rainbow as on an IBM PC. AB86 does a very good job here. The only place it deviates is with some standard Business BASIC screen control commands (for example, CF, which clears only the high intensity portions of a screen) because they cannot be duplicated using MS-DOS. But the deviation is minor because AB86 contains a word with the address of the screen memory. Moving to another machine basically takes a one-word patch and some fiddling around to accommodate the MS-DOS inconsistencies. Since AB86 uses only MS-DOS calls, it is very transportable and can use features such as device drivers. Applications BASIC in fact requires MS-DOS 2.0 or higher since it uses the ANSI.SYS device driver for screen output. Even so, I stuck the diskette I had into a Texas Instruments PC under MS-DOS 1.25 and had no trouble bringing up Applications BASIC. It worked fine except for some screen output functions that required knowledge of where the CRT's memory is. I liked this very much.

Its device drivers were designed with transportability in mind. For example, if you print ESCape [20;20H using ANSI.SYS, you position the cursor to row 20, column 20 regardless of whether your program is running on an IBM PC, TI PC, or DEC Rainbow.

### Between the Covers

The manual I had was preliminary. It was produced on a word processor and photocopied. A new version, in the standard IBM-size format with slipcase, has since been produced. My one big complaint was that only a couple of short utilities were included. This can be a hindrance to the inexperienced and makes programming that much more difficult. The version I tested was not 100 percent bug free, but it worked extremely well.

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Any bugs I found have since been corrected.

Applications BASIC has several other nice features that I should also mention. There are instructions called GET and PUT that read disk sectors, which makes disk I/O very fast. GETting sector 0 returns the boot record. Writing utilities to work with the disk—to do such things as unerase a file or rebuild a file—is child's play. I wrote a nice disk hex dump program in about 20 lines of code! Applications BASIC can also read and write to any MS-DOS file. For instance, I could open a *WordStar* file in a BASIC program and simply read it in. AB86 also allows you to have up to 63 files open at once. This is very convenient when writing a tightly integrated application that must do a lot of validation of data entry.

All in all, Applications BASIC epitomizes what is good about a small software house. It is well written, small, and fast (considering it uses MS-DOS calls) and was produced quickly. It is being improved rapidly, and the authors are willing to listen to suggestions for enhancing it. Applications BASIC is also very easy

Applications BASIC may be the most MS-DOS-compatible product I have ever seen.

to use. It does not suffer from an accumulation of elaborate features that require equally elaborate documentation. All you need to do is stick in the program diskette, type AB86, and you're in business.

I should also mention that Soft Gold also has a CP/M-80 version that is virtually identical to the MS-DOS version. You can move your code to a good old CP/M machine (even a Commodore 64), and it will still run fine (unless you have written some MS-DOS utilities). In this day and age, it's unusual to see a product

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## BUSINESS BASIC

that is developed on a 16-bit machine and then moved to an 8-bit one.

Soft Gold will be introducing a compiled Business BASIC (the first one ever)

by the end of this year and plans to add new features, such as 120-character variable names. The company is also looking into graphics. (By the way, Soft Gold's

Applications BASIC will also run perfectly on an IBM PCjr with 128K and one floppy and DOS 2.1. It also runs on the DEC Rainbow, TI PC, and almost any PC workalike.)

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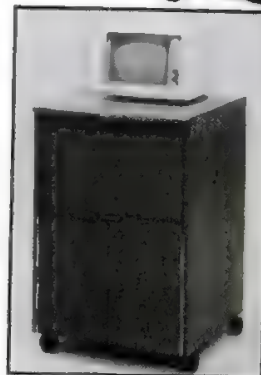
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### SMC's Thoroughbred BASIC

SMC's entry in the race, Thoroughbred BASIC, is a fine example of a product produced by a much larger company. SMC is a large (large like Microsoft, not large like IBM) software house that has been writing Business BASIC interpreters and other Business BASIC products for some years. SMC's approach to Business BASIC on the IBM PC was drastically different from Soft Gold's. Instead of writing a language to run under MS-DOS, the company took the view that the PC-XT is fully capable of being a multi-user small business system. To achieve this, SMC wrote an entire operating system, Thoroughbred/OS (T/OS), that supports two additional stations on a PC-XT. You *can* run the system on a regular PC, but it is of little value because floppies can support only primitive utilities with T/OS. It is really intended for a PC-XT. Watching three users work on the same diskette simultaneously is a sight to behold. T/OS supports only one language—SMC's Thoroughbred BASIC. In fact, you talk to the operating system using BASIC commands. As a concession, the Thoroughbred Operating System allows an MS-DOS partition on the PC-XT's fixed drive, but basically the company has transplanted its product down to the PC.

Thoroughbred BASIC is consistent with SMC's other versions of BASIC. It also is a BBIII-compatible product. Clearly it is directed at business users with PCs who are looking for SMC's BASIC or who wish to run multiple stations.

The documentation is extremely professional in layout. It is much better than IBM's, in both appearance and readability. Even a novice user can install T/OS using the manual's step-by-step instructions. I might point out that while a small company usually cannot match the

quality of this presentation, it is also unlikely to commit the occasional howler of an error in the documentation such as SMC has in its Thoroughbred BASIC manual. For instance, to add on a second terminal you must tell T/OS what type of terminal it is. A table of CRT types is conveniently provided. This would be nice, but the table contains only a list of numbers, and nowhere is it explained what 0950 or 0300 or 8000 means! The product still needs some work to clean out these errors and the occasional program bug, such as this one: You can allocate your

SMC's implementation supports "ghost tasks," which allow you to run more than three tasks at once.

T/OS partition without any trouble, but the utility provided for it cannot reallocate the partition!

In fairness, though, SMC's Basic works very well. I found no bugs in the actual BASIC. SMC also provides a very large array of utilities, which are very useful for programmers and end users alike.

SMC's implementation also has other useful features. It supports "ghost tasks" (jobs that do not interact with the terminals). This allows you to run more than three tasks at once. For instance, printing a report is a good way to use ghost tasking (sometimes called background tasking). SMC's BASIC also supports exponentiation and floating-point arithmetic, but it allows only 15 files to be open at once. It has a utility to allow the user to define new mnemonics (for example, defining YN to display "Enter (Y)es or (N)o" to make programs more readable).

SMC's BASIC will currently run only on the PC-XT or a very compatible unit. The company is adding support for foreign hard disks and a streaming tape backup. It

has also introduced an MS-DOS version (too late, unfortunately, for this review). SMC has a product for doing color graphics on a color graphics CRT (not a color

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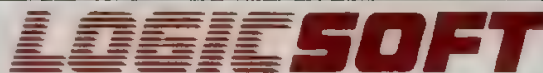
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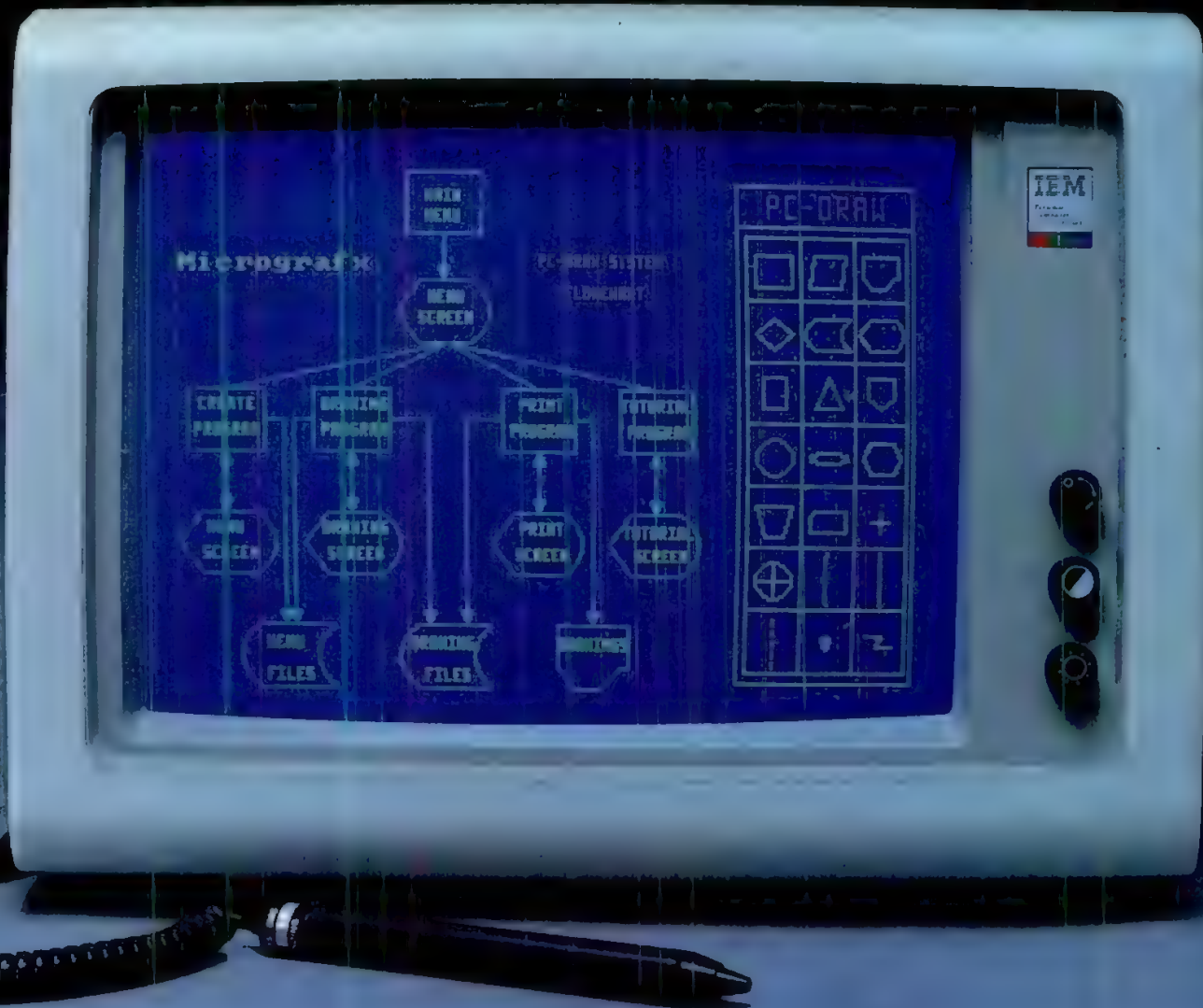
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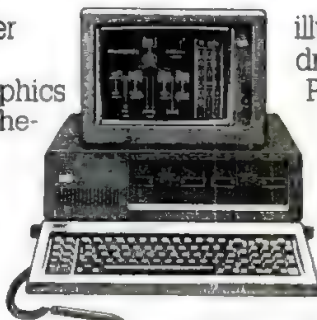
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## BUSINESS BASIC

monitor) attached as a second terminal to the PC and is looking into adding graphics capabilities for use with a regular color monitor.

### Decisions, Decisions

Well, by now you may be ready to run out and buy one of these products. The question is, which one should you buy?

My suggestion is this: If you want to program in Business BASIC, buy Soft Gold's Applications BASIC. It runs under MS-DOS and is a very nice way to learn how to use Business BASIC—not to mention that it's the cheapest way.

SMC's Thoroughbred/OS and Thoroughbred BASIC are really for businesses that need multiple stations on a PC or need customized software. SMC also sells a full line of accounting packages and a database manager, *IDOL*. Many OEMs and dealers have also developed products that run

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SMC's product is really for businesses that need multiple stations on a PC or need customized software.

under SMC's Thoroughbred BASIC for specific types of businesses. The best part of all this is that you are getting source code for all these products. If your business needs custom software or wishes to make alterations to a package, this is wonderful. No need to gripe, just get a programmer or programming firm to alter the basic package for you. Because so much more software is available under SMC's Thoroughbred BASIC, it is the one I would recommend to a business or business people interested in doing their own programming.

I can heartily recommend both products, depending on your needs. If you want to learn Business BASIC or do any nongraphic application, try Applications BASIC. If you want to treat your PC-XT as a serious business machine, give SMC a call. Either way, you'll be introduced to the merits of the granddaddy of all BASICs in common use today, and one that is undoubtedly the most pleasant programming language for the average user. ■



# THE BASIC For Professionals

**B**ASIC has been around longer than the microcomputer. Countless people have learned the fundamentals of computer programming using this language, and a good percentage of this population has never moved up or away from it.

Over the years, BASIC has been modified and improved to the point where many fairly sophisticated and successful systems have been written entirely in this language. Recently, several new versions of this language have been introduced. One of the most significant is a product called Professional BASIC, from Morgan Computing, of Dallas, Texas.

In spite of its longevity, BASIC has been criticized by many authorities as an ineffective and perhaps dangerous programming language. Some believe that learning to program in BASIC will prevent you from becoming an effective programmer because this language encourages poor programming habits.

While this view is certainly harsh, BASIC does have several design flaws that inhibit or prevent the use of proper program structure and style.

Although IBM PC BASIC is a great

Morgan Computing's implementation of BASIC adds a strong set of visual programming and debugging tools to this old and somewhat limited language.

improvement over the original version, it still has many deficiencies. It suffers from a number of problems:

- Procedures are numbered, rather than named;
- Program size is restricted to a maximum of 64K;
- Several verbs, which would improve the overall structure of the programs written in the language, are missing;
- The mechanism used to implement sub-routine calls is limited in scope and slow in execution;

- The number, type, and precision of the available data structures are limited;
- Program testing support is primitive;
- Program execution is relatively slow.

Let's take a look at how Professional BASIC (hereafter PBASIC) meets these deficiencies. PBASIC is a logical subset of IBM PC BASIC (which Microsoft also markets as GWBASIC). Almost all the features found in IBM PC BASIC are included in the PBASIC product. With a few exceptions, systems written in IBM's version of the language should run under PBASIC.

In writing this updated version, Neil Bennett, the program's author, has incorporated a level of visual support unprecedented in both mainframe and microcomputer environments. To explain, I'll divide the features of PBASIC into the following categories: improved program environment support; new immediate commands; new visualization and debugging screens incorporated into the language.

## Improvements

Morgan's implementation of the language allows BASIC programs to use all available memory. Theoretically, with the



## PBASIC

appropriate hardware boards, you could write programs that use up to 640K. Practically speaking, this means that a program can take advantage of features like huge

data tables, which are needed to solve certain problems. PBASIC fully integrates Intel's 8087 Numeric Data Processor (NDP), a device designed to perform

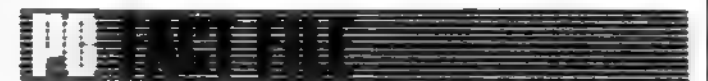
floating-point math operations. The NDP performs these functions precisely and quickly. Unfortunately, the first release of PBASIC requires the 8087. The vendor promises that this is only a short-term restriction and that the next release will work with or without an 8087 chip.

With IBM PC BASIC you can use variable names of up to 40 characters long, whereas PBASIC allows names up to 320 characters. Although this capacity is greater, the feature is impractical. More important is PBASIC's support of named procedures. Like a variable name, a procedure name may be up to 320 characters long and may be used as the object of a GOTO or GOSUB verb just like a line number. Line numbers still are used and required for each line of PBASIC code. Consider the following coding example:

```
10 Main.processing.rtn;
20 GOSUB init.pgm.variables
30 GOSUB build.menu.screen
40 IF PGM.EOF
    THEN GOTO term.pgm
```

In the example above, the programmer could refer to the first line as Line 10 or by using the procedure name such as GOTO Main.processing.rtn;. PBASIC ignores capitalization but doesn't force variables into uppercase like IBM PC BASIC does. For example, main.rtn and MAIN.rtn are treated as the same name.

Another PBASIC improvement and one that is becoming increasingly popular with language developers is the use of semi or incremental compilers. Pascal has



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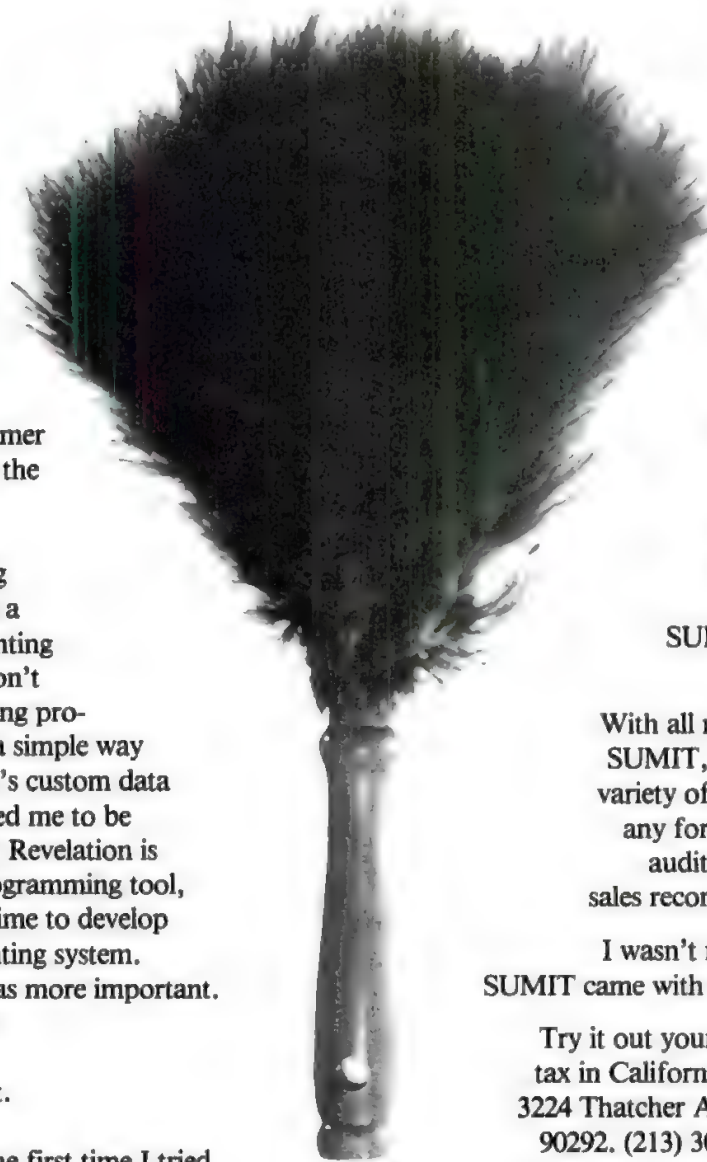
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used this technique from the very beginning. Briefly, the difference between the traditional interpreter approach used by IBM PC BASIC and the semi-compile

approach of PBASIC is that overall the semi-compile version is quicker to use.

With an interpreter, each time an instruction assumes control in the pro-

gram, it is individually converted into executable code and then executed. If you have a loop in which a line of code assumes control 500 times, the instruction is converted and executed 500 times.

With a semi-compiler, the program is first converted into an intermediate form, which Morgan calls pseudocode. The pseudocode is not directly executable by the computer. It is a partially converted code that will be completely converted by a run-time routine, which is part of the PBASIC language. There are several advantages to this approach. The program executes faster; the semi-compiler checks and flags all logic errors; and there is no performance penalty for the definition of often-used variables late in the program execution.

This approach's disadvantage is that the semi-compile process itself, not the overall run, is time-consuming. In PBASIC when you enter RUN, the program pauses before beginning. The pause is unnoticeable for small programs, but can be distracting for ones that are 150 lines or more.

Other environment features and some restrictions are:

- Integer variable can be plus or minus 2 billion;
- The DIM statement supports upper and lower bounds. For example, the statement DIM YR.TOT(1983 to 2000) is allowed. A subscript value of 1983 would reference the first field in the table;
- The SAVE command saves programs in the ASCII format only. A compressed format is not supported;
- When PBASIC stores numbers in a random file it uses the IEEE standard format instead of the nonstandard one used by the IBM BASIC. Random files are therefore not compatible between the two products.

## Syntax Review

The environment feature called "Dynamic Syntax Checking", deserves particular attention. PBASIC checks each character you enter when in the command



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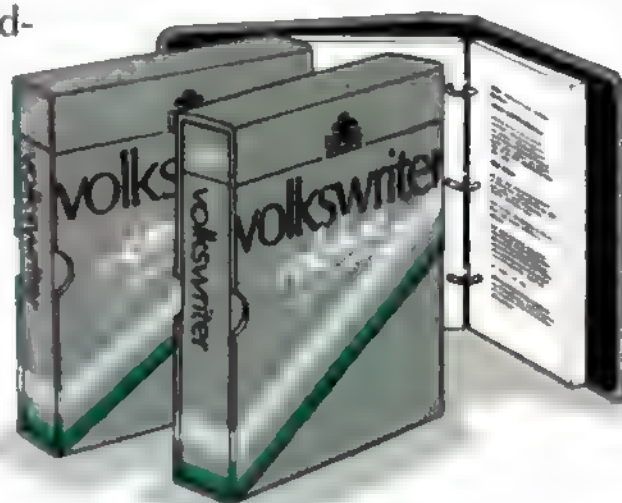
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mode and ignores any key press that would cause a syntax error. If you enter three invalid characters in a row, PBASIC will beep for the first two and display a "try line" on detecting the third. The try line shows all characters valid at that point in the syntax of the statement you are entering.

With this system, it is impossible to enter a code line with a syntax error while in the command mode. If you change the source file on the disk using any editor capable of handling standard ASCII files and then read the program into PBASIC, the product will check syntax and flag errors it finds as part of the read process.

#### Commanding Levels

PBASIC uses several new and unusual commands at the command level. One useful feature of PBASIC is the FIND LABEL command. This function will list every line in the program that refers to "label." In this case, *label* refers to both procedure and variable names. Another version of the command is FIND LABEL = . Coded this way, the command will list only those lines in which the value of the variable is changed. A companion opera-

PBASIC uses  
several new and  
unusual commands  
at the command  
level.

tion is the SEARCH STRING command. It will list every line that contains the specified string.

The language allows the setting of break points at a given line number or procedure name. When the line or procedure name gets control during program execution, the program stops. This is the equivalent of coding a STOP verb to force the program to quit at a strategic moment. The NOBREAK function will remove some or all break points with one command, and,

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## PBASIC

in any case, the break points are never saved with the program. The **BREAK** command is the first of many tools integrated into PBASIC to simplify learning and debugging of the BASIC code.

Another notable feature is the **FINE-TRACE** facility. With **FINETRACE** turned on, PBASIC will show each intermediate value as a program computes a mathematical operation. For example, if you coded `WORK.YR + YR.MO/12 + WORK.DA/365.25`, PBASIC would display the next intermediate result each time you pressed the spacebar. It would continue until the final answer is calculated. The **FINETRACE** mode is invoked automatically during the program execution of certain run-time errors. Division by zero is an example.

Unfortunately, some valuable features of IBM PC BASIC have not been incorporated in PBASIC. One is the built-in full-screen editor. While this has some drawbacks, it clearly is superior to the old line editors that came before. Unfortunately,

Some valuable features of IBM PC BASIC were not incorporated in PBASIC.

ly, PBASIC has only a line editor. Although it is a good one, it does not support full-screen editing. This appears to be one of the casualties of implementing the dynamic syntax checking subsystem.

### No Keyboard Macros

Another feature missing is keyboard macros. With IBM PC BASIC, you can hold down the **ALT** key and press the **P** for **PRINT**. Many of these macros made entering code faster and less error prone. With PBASIC, the coding errors are not a problem, but each verb must be keyed in as there are no shortcuts. However, this is not so with the variable and procedure

names. If you enter enough of the labels to make it unique and the "at" sign (**@**), PBASIC will complete the entry for you.

### Visual Modes

The heart of PBASIC is its program debugging and display windows. There are more than 17 of them, and they allow a level of control and ease of understanding that has been unavailable until now.

When you test your program, or you wish to see your program execute for any purpose, use the **SRUN** command. This will run the semi-compile function and set you up at the first window. This window is called the List Trace. The first window line is called the status line. Frequently updated, it contains a variety of information including:

- The line number of the next instruction to be executed;
- The number of instructions executed so far;
- The speedometer (the number of instructions executing per second);
- Status of the **Ctrl**, **Alt**, **Shift**, **CapsLock**, and **NumLock** keys;
- Windows currently active;
- Number of active **FOR/NEXT** and **GOSUB**s;
- The cursor's current location on the user screen (row and column).

The currently executing instruction is highlighted on the screen by a green bar, which moves when each instruction is carried out. From a training and learning perspective, this new visual format has enormous consequences. Now a loop becomes a visible pattern on the screen—not an abstract concept. The operation of a **GOSUB** is easy to track and understand. Other verbs, that were once complicated to explain and difficult to grasp, now become clear.

When you first enter the List Trace window, program execution is suspended. Each press of the spacebar progresses the instruction. If a branch takes place off the screen, the display is instantly updated and the new code revealed. By holding down



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## PBASIC



Figure 1: Split screen, List Trace, plus Variables window. The current instruction is highlighted.



Figure 2: Split screen, List Trace, plus Chronological Trace.

the spacebar, execution continues slowly. If the Enter key is pressed, program execution begins at full speed and the highlight bar blurs across the screen attempting to keep up. Another press of the spacebar freezes the action, and the program stops again.

Using these simple tools, you have complete control over the program's exe-

cution. With break points, which can be inserted in this mode by pressing a single-key combination, the program can be executed at full speed until a point of interest is found. Then you can do single-step tracing to follow the program's exact logic path. These are only a few of the many features.

One option of the List Trace window



## PBASIC

that will flag each unexecuted line. Another option of this window displays the number of times each verb assumes control; yet another option dynamically creates an

in-line histogram, a horizontal bar chart, next to each line. This shows graphically how long each instruction has taken to execute as a percentage of total run time.

To invoke these other options you need only press a single key.

### Windows on BASIC

By pressing the V key, you change the display instantly to the variable window. This screen shows alphabetically every nonarray variable in the program along with the variable type code and actual value. The usual scrolling keys (PgUp, PgDn, and the arrow keys) can be used to move through the display. While this is interesting and helpful, it is more useful to look at both windows simultaneously and PBASIC provides this capability. The screen is divided in half vertically and each window gets half the display, as Figure 1 shows. Whenever an entire line cannot be displayed because of a small window, a backslash (\) symbol appears to mark the break.

To invoke the split-screen mode from the List Trace window, you simply press S (for split). The default second window is the Variables window, but any one of several windows can be selected. Even their position (left side of screen or right side of screen) can be changed instantly by pressing the E key (for exchange).

When I say *instantly*, I mean it. I made a few short benchmark runs testing screen display speed. The results showed PBASIC is almost five times faster than IBM PC BASIC at displaying information on the screen, and four times faster than compiled BASIC. Although the tests were simple and incomplete, the results illustrate the product's screen-handling efficiency.

In spite of all this activity on the display, normal screen output produced by my program is still simple to achieve. By pressing P (for print screen), you are immediately shown the screen display produced by your program. Whenever your program issues an INPUT verb or INKEY\$ verb, this action happens automatically. In this mode, all of the keys have their usual meaning, that is, S is the letter S, not the split-screen command. To get out of this mode, you use the Alt-letter

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
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combinations. For example, Alt-v will take you to the Variables window and Alt-l to the List Trace window.

### Other Specialized Windows

PBASIC has many more useful windows to work with, including one that handles the display of array variables only. This screen is formatted like the Variables window but has additional scrolling keys to handle large tables. With this window you can scroll 100, 1000, even 10,000 lines at once by pressing a single key. Windows are provided to track GOSUBs and FOR/NEXT loops. For each FOR/NEXT pair active, this PBASIC window displays the beginning index value, ending index value, increment value, and current value of the index.

One of the most important windows is what Morgan calls the "Chronological Trace Window." Figure 2 shows an example of this window split with the List Trace window, which is the way you would most often use it. The Chronological Trace displays each instruction as it executes, along with a unique "serial number." This turns out to be the associated instruction count. If the instruction modifies any variables, the trace also displays the new value of the modified ones. With the List Trace, the displayed code remains static, and the highlight bar dances around. The Chronological Trace works differently; the instructions scroll from the bottom screen to the top. Each time a new instruction is executed, the oldest instruction at the top scrolls off.

### Chronological Listing

However, Chronological Trace's importance is not the way it scrolls, but the options it offers. What this trace allows you to do is run the program backwards. More accurately, PBASIC saves previous program lines and enables you to review these lines simply by pressing the appropriate scrolling keys. In operation, it appears that you can run the program forward, then back up several hundred lines at will and review the results. The combi-

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## PBASIC

nation of these functions, with the spatial relationships made clear by the List Trace window, allows observation and rapid understanding of the executing code—something absent from any other language.

PBASIC also provides windows that show memory dumps, windows which show the actual pseudocode being executed, and those that demonstrate all Data items in the program while highlighting each item as read. Still others provide a view of input and output file buffers.

### A Clicker Too

There are other unusual features, such as a built-in clicker, which may be turned on or off. As you execute each instruction, you'll hear a click. In this mode, you can hear the program execute and, by sound, determine execution speed.

Good as it is, PBASIC has design lim-

itations and drawbacks and is demanding of its systems requirements. Besides the 8087 chip required for the products first release, PBASIC needs also a minimum of 256K and at least one disk drive. The system supports only a monochrome screen or a non-IBM color/graphics adapter. It also requires DOS 2.0 or 2.1.

In spite of the outstanding range of debugging screens and facilities, the product only implements the BASIC language as contained in IBM PC BASIC. Therefore, several flaws common in the IBM PC BASIC are in PBASIC. My main objection is the lack of facilities such as local variables and flexible subroutine calls. After all, a Professional BASIC should allow professionals to write professionally. To Morgan's credit, the company is planning improvements in this area including a 128K mini version of the prod-

uct and a true native code compiler.

For the first time in the history of both mainframe and microcomputer languages, here is a product that supports powerful and useful visual tools. In doing so it changes the very nature of the program-debugging process. From another perspective, these same facilities are unique in that they provide an environment for learning about the programming process and how programs operate.

If you are programming in BASIC or are learning to program for the first time, you will be hard pressed to find anything better than PBASIC. At the very least, PBASIC is a product to watch. It could well be a harbinger of things to come. ■

*Don George is a training manager for a large insurance company in Los Angeles. He is currently authoring two books on BASIC and COBOL.*



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# Hard Hats and Bows

Hard Hat Mack from Electronic Arts is trying to pass itself off as art but ends up as image and hype, while Atari's Ms. Pac-Man turns out to be a woman of substance.

**H**ooray for Hollywood! The land of make believe, where image is everything. After all, who needs steak when you can simulate a nice juicy sizzle?

And *Hard Hat Mack* has plenty of sizzle. It's Electronic Arts' first arcade game entrant to the IBM PC market, and this company has declared its intent to "fulfill the potential of personal computing" and elevate the computer programmer into the realm of the artist. It has some of the most truly pretentious advertisements ever seen in computer magazines—including soft-focus superstar portraits of their principal programmers (among them pinball wizard Bill Budge). And the packaging for their products is a direct lift from the glitzy world of the record industry: shrink-wrapped double albums complete with color cover photo. Inside you'll find a set of portraits and cutesy biographies of the "artists"—software designers Michael

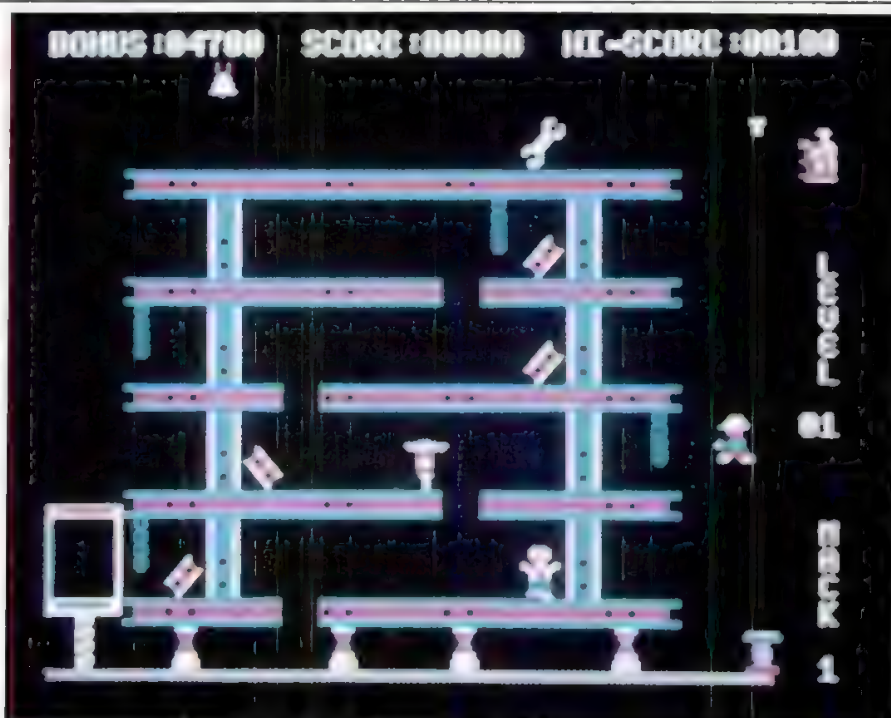
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(415) 571-7171

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An early screen from *Hard Hat Mack*, showing the building in progress.

Abbot and Matthew Alexander.

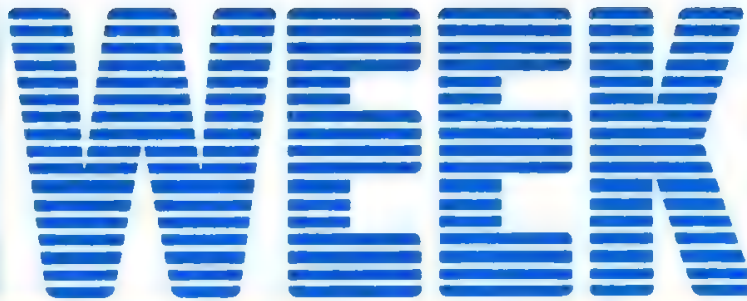
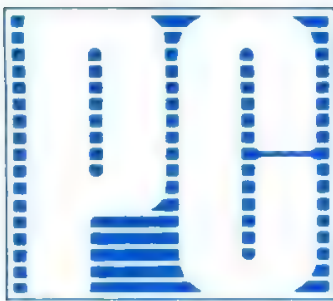
The game itself is a variant on the *Donkey Kong* chutes and ladders motif, with a couple of clever twists. You are cast as Mack, "a bona fide Working Class Hero." The game's description says he "reads Eric Hoffer," and is "fueled by cupcakes and an unshakable belief in the work ethic."

Your goal, as you scurry around an

attractively drawn construction site, is to finish the building Mack is working on by installing and then riveting beams, moving blocks of steel, and collecting tools. "Sound easy?" the skimpy instructions ask. "Then you're forgetting about government regulations, the neighborhood punks, and the fact that falling bodies (including your own) accelerate at the rate of 32 feet per second<sup>2</sup>."

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IBM PC XT					
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IBM PCjr					
IBM Compatibles (Compaq, Eagle, etc.)					
Other (Not IBM or Compatibles)					

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- |  |   |
|--|---|
| <input type="checkbox"/> A. Use them                 | <input type="checkbox"/> F. Other involvement (specify) |
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| <input type="checkbox"/> C. Establish specifications | <input type="checkbox"/> G. No involvement              |
| <input type="checkbox"/> D. Approve purchase         |   |
| <input type="checkbox"/> E. Acquire them             |   |

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- ☐ 2. For resale
- ☐ 3. Other (please specify)

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- |   |
|---|
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- 9a. Please indicate below the applications for which these Personal (Micro) Computers are used.

- |   |   |
|---|---|
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## PC ARCADE

### Tormentors

Your tormentors include vandals who "think you're spoiling their neighborhood. They say things about your mother. They have no sense of the value of life, especially yours." Also intent on interfering with the successful completion of your assignment is OSHA. (Get it? Will your 10-year-old kid understand that OSHA stands for Occupational Safety and Health Administration? By the way, has your kid read Eric Hoffer?) OSHA is described as having a "crew-cut, a clipboard, and absolutely no sense of humor—living proof of the banality of evil. The government sends a generous supply of these guys to cite you into oblivion."

*Hard Hat Mack* has three screens, each busier than the one before, and each requires you to learn one or two basic maneuvers in order to master the round. The authors have done a nice job with some of the little details—the screens are attractive and the play response is good from the keyboard or with the aid of a joystick and game adapter. I like the fact that Mack has to go find the rivet gun and return to the scaffolding to fully install the steel beams. There's a cute sequence involving the construction site elevator, too; to summon it to an upper floor, you have to jump at the right spot and hit the bell with your hard hat. And the third level includes a portapotty in your path, and a set of live exposed wires at the end of a wrong-way conveyor belt. The game's sound effects are mildly interesting, and they can be shut off if they start to annoy you.

### Features

The game includes a joystick calibration subroutine and the ability to redefine keyboard commands for movements up, down, left, and right as well as jumps and drops. You can restart in midplay, and you are allowed to jump from the title screen into any of the three levels, which is a great help when you're practicing. One thing I don't like is that the Ctrl-Alt-Del exit from the game has been disabled; you have to shut off the computer and turn it on

again in order to load something else into the machine. High scores are retained in memory but are not recorded on disk, so they are lost after each play session.

Anyway, I may not know much about art, but I know what I like. *Hard Hat Mack* is like computer game pop art—flashy to the eye, but hollow inside. For all of its nice little touches, I quickly became bored. I mastered the first screen pretty easily, stumbled over the more difficult second and third screens, but found that I

Your goal is to finish the building Mack is working on by installing and then riveting beams, moving blocks of steel, and collecting tools.

really didn't feel compelled to learn them. Although obviously well crafted, *Hard Hat Mack* seems to suffer from a lack of precisely what Electronic Arts claims as its forte: the artistic spark that grabs you and makes you want to come back time and time again.

I don't mean to demean Electronic Arts' lofty goals, nor its decision to give credit where credit is due—to the programmers. However, the product should justify the kudos; otherwise we've got nothing but hype, and we deserve more.

I guess what I'm saying is that I did not find *Hard Hat Mack* to be especially riveting. On *PC Magazine's* rating scale, from a low of 0 to a high of 6, the game would seem to be still under construction:

FUN:	2.5
CHALLENGE:	3.5
COLOR/GRAPHICS:	4.5
TOTAL:	10.5

*continued*

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Feminists take note: *Ms. Pac-Man* is, as the advertisements claim, "More than *Pac-Man* with a bow." I found this game to be more lively, more playable, and ultimately more enjoyable than the original, and Atari has done an admirable job in transferring this coin arcade favorite to the small computer screen.

If there is anyone alive who doesn't know the basic premise of *Pac-Man*-type games, it goes like this: You are a cute little round character with a huge appetite for little dots that litter the alleyways of a maze. You must scurry through the maze, eating up as many of the dots as possible, all the time avoiding the pursuing "goblins" who mean to eat you! In the corners of the maze are enticing "power pills" that, once eaten, turn the tables for a few precious seconds. At that point, *Ms. Pac-Man* can chase after and eat the ghosts for extra points. When the magic moment is over, it's back to hot pursuit.

Now, thus far this description could apply to both *Pac-Man* and *Ms. Pac-Man*, both of which are available for the IBM PC in official versions from Atari. But in this new, distaff version, the heroine (adorned with a little bow) is much more wily. She moves more easily than her male friend, she lives in a more refined maze with extra escape tunnels, and she seems to be able to beguile her ghostly pursuers into mistakes of strategy. I imagine she's a real *Pac-Man*killer.

There are four different mazes in the computer game version, with a little animated scene dramatizing the meeting, courtship, and enrapturing of Mr. and Ms.



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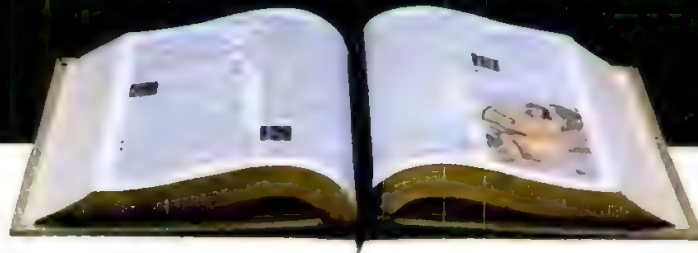
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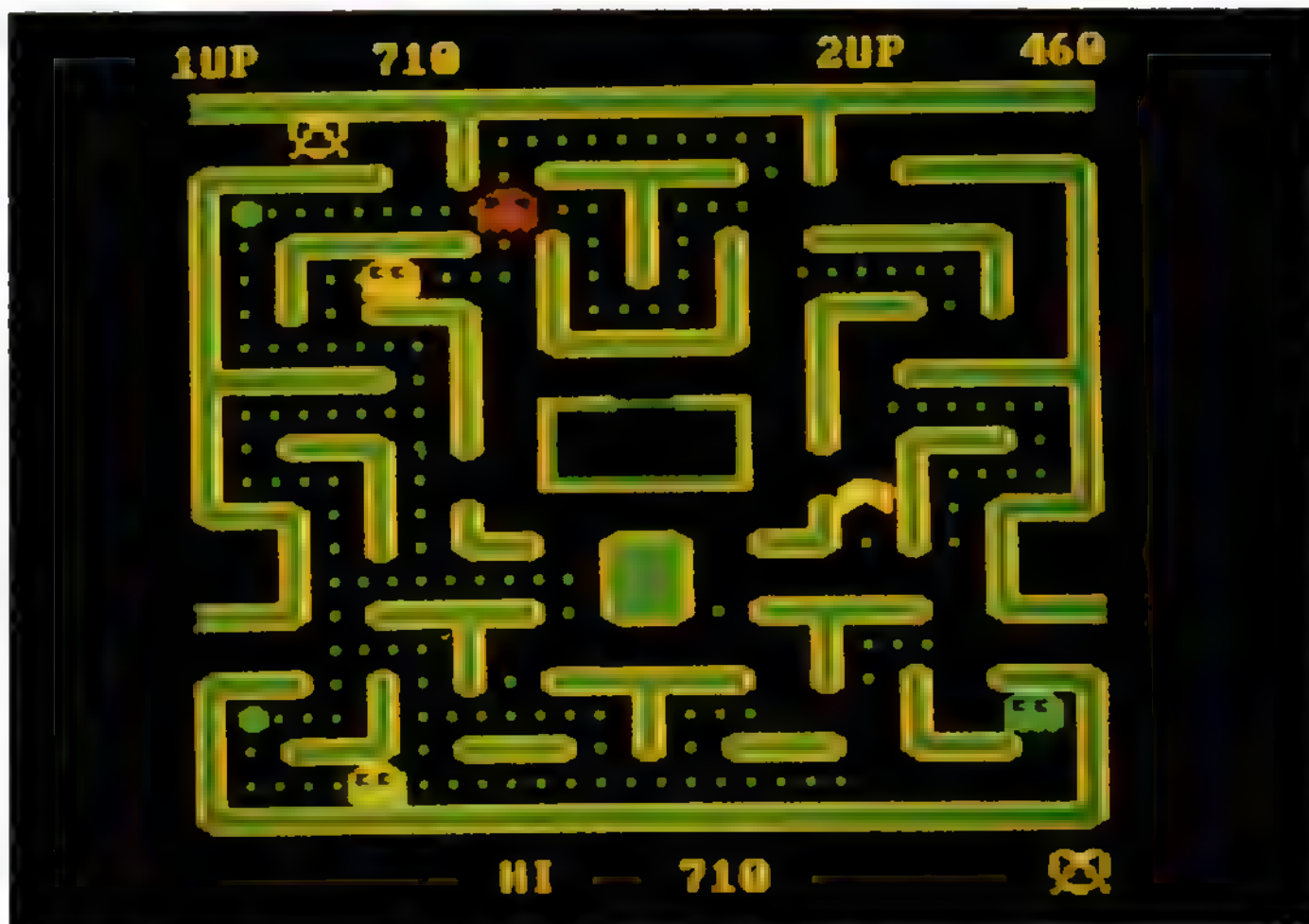
## PC ARCADE

Pac-Man appearing on the screen after you complete each level. Each maze has several levels, with various special point bonuses for devouring extra goblins or goodies.

It's hard to pin down exactly what it is that gives *Ms. Pac-Man* her allure. She's just, shall we say, a bit more seductive than her male friend. It's a question of artistry, and, as noted earlier concerning *Hard Hat Mack*, you've either got it or you don't. Here's to you, *Ms. Pac-Man*—you're one classy dame.

On *PC Magazine's* scorecard from 0 to 6, *Ms. Pac-Man* gobbles up a bunch of goodies:

FUN:	4.5
CHALLENGE:	4.5
COLOR/GRAPHICS:	4.5
TOTAL:	13.5



■ A *Ms. Pac-Man* screen showing the heroine busily chowing down.

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# The Fruits of Technology: Stressing Solutions

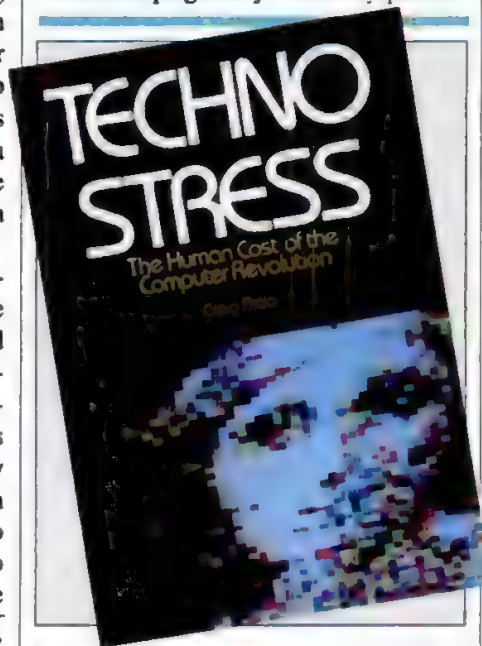
Are you likely to suffer from "technostress"? Is it possible to get even more out of WordStar? The two books reviewed here may have the answers to these and other questions.

**H**ere is a quick test to see if you're likely to become a victim of what Craig Brod calls "technostress": Do you spend many hours a day working at a computer terminal? Is your vision blurry after working at the computer for several hours? And most importantly, do you often find yourself relating to others and behaving more like a computer than a person? If you answer yes to any of these questions, you may be suffering from technostress.

According to Brod, a California psychotherapist, technostress results when the "delicate balance between people and computers is violated." In his book *Technostress: The Human Cost of the Computer Revolution*, Brod defines technostress as a modern disease caused by an inability to cope with computer technologies in a healthy manner. "It manifests itself in two distinct, but related, ways: the struggle to accept computer technology, and in the

more specialized form of overidentification with computer technology."

With the first type of technostress, individuals are plagued by an anxiety-produc-



ing reluctance to use computers. Other symptoms of this type of technostress include irritability, headaches, nightmares, resistance to learning about computers, and an outright rejection of computer technology.

On the other hand, technostress can also occur among individuals who have "too successfully identified with computer technology." In this case, the computer

becomes the core of a person's existence and that person loses the capacity to feel and relate to others.

Technocentered individuals exhibit a high degree of factual thinking, poor access to feelings, an insistence on efficiency and speed, a lack of empathy for others, and a "low tolerance for the ambiguities of human behavior and communications."

While the book's main focus is on the psychology of the interactions between individuals and machines, *Technostress* may also be of interest to managers who are integrating new technologies into their offices. Brod maintains that firms should develop humane policies that must recognize "the psychological needs of employees by taking into account the nature and the content of their assigned tasks." Brod also believes that employees should be allowed to decide for themselves when they need a break, since the traditional 15-minute coffee break is no longer enough "given the intensity of computer work."

*Technostress* recommends management take steps to ensure that the old lines of informal communications between workers are maintained. It is essential, says Brod, that organizations allow time for people to meet informally to "talk as they did prior to the introduction of computers."

## ***Technostress: The Human Cost of the Computer Revolution***

Craig Brod

Addison-Wesley Publishing Company  
Reading, MA 01867

(617) 944-8660

Copyright: 1984

Cover Price: \$16.95

ISBN 0-201-11211-6

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## BOOK REVIEW

*Technostress* provides a comprehensive overview of what computers may or may not be doing to the mental health of people who work with them. Brod describes the anxieties that may afflict all types of computer users and gives advice on how to avoid becoming a victim of technostress.—Roy Katz

### Using the IBM PC: WordStar

C.J. Puotinen

Holt, Rinehart & Winston

385 Madison Ave.

New York, NY 10017

(212) 872-2000

Copyright: 1983

Cover Price: \$17.45 (Also available with tutorial diskette for \$40.45)

ISBN 0-03-062857-1

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The best-selling computer program ever written, according to a recent *New York Times* article, is MicroPro's *WordStar*. There are many reasons why this word processing package is so popular, but its manual is not one of them. The original version of the documentation was so inscrutable that purchasers often had to buy one of the many independently published how-to-learn-*WordStar* books to get up and running. These books also sold well because there were hundreds of thousands of pirated copies of *WordStar* floating around the country—copies that came with no documentation whatsoever.

Most of the books concentrated on the fundamentals and did manage to teach users how to get started. Perhaps as a reaction to this aftermarket, MicroPro released a vastly improved edition of its manual at the end of 1983. While this new documen-

tation was far from perfect, it covered the same territory as the aftermarket books, with the same essential clarity and cloying cuteness. And, of course, the new MicroPro manual did not leave anything out; the independent books usually glossed over many of the more powerful features of *WordStar*.

The latest tome to rehash the manual is a slick 367-page production from Holt, Rinehart & Winston, by C.J. Puotinen. It's called *Using the IBM Personal Computer: WordStar*. (After trying for several minutes to see if this name was an anagram of anything recognizable, I gave up.)

*UTIPC:W* uses an "at" sign (@) to mean "hit the Enter key." This is presumably because it is too hard to say "hit the Enter key." The explanation for this is buried in a section on using DOS, which

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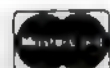
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## BOOK REVIEW

many readers will skip over. Anyone who is not taking his computer out of the box for the first time should realize what that symbol is doing in every line, but you can

be sure that hundreds of confused purchasers will wonder why they're getting nowhere or running into trouble. This is just plain stupid. There are other lapses

sprinkled throughout, like stale raisins.

While the book does cover most topics fairly exhaustively and is written in passable English, it has two things wrong with it. It is dreadfully dull, dry as dust. Sorry, CJ—putting in a recipe for chicken enchiladas doesn't spice up interest sufficiently. And it is overwhelming. There is a vast quantity of information hurled out of its pages in a willy-nilly manner without regard for what is important. The book simply cries out for organization.

Still, *UTIPC:W* does a decent job of teaching the ropes, and it covers a lot of

This is an overwhelming book. There is a ton of information hurled out of its pages willy-nilly.

ground. It's far from perfect but is fairly handsome and complete. If you had to learn *WordStar*, you could do worse than to buy this book. And it's filled with quizzes and tests, so if that's the only way you can learn, this is the book for you.

But what the world needs now is not one more of these. Instead, we need a book that would take you progressively through the thickest of *WordStar* commands and drop you off at any point with enough all-around knowledge to get what you want done. It would also be helpful to learn how to master some of the more important, little-used commands to which all such books give short shrift.

The most important thing of all is that *WordStar* in its present incarnation is a real pain to use. This book, like most others on the subject, pays virtually no attention to the many things you can do to make operating this program a pleasure rather than a chore. Maybe this information was supposed to go in the 13 blank pages at the very end of the book?—Eric Berg

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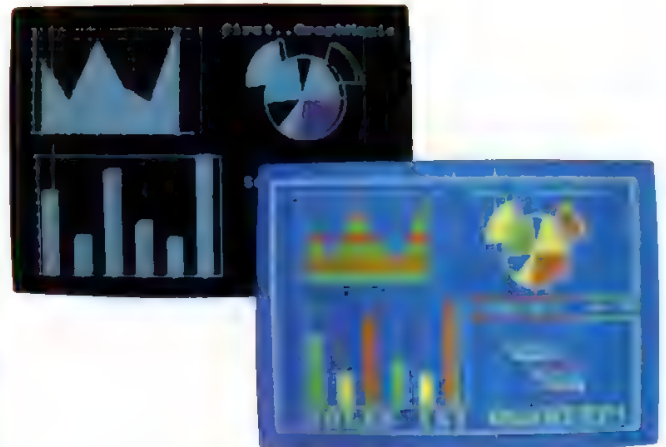


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# Micro-Biology

A PC and MICROBE, a program written to keep track of patient specimens and results, have taken over the information-management functions of a microbiology lab.

**T**he influx of computers into hospital clinical laboratories has turned into a flood within the last few years. Lab sections with many repetitious procedures were the first to switch to microprocessor control of instruments. In contrast, work in the microbiology section, which determines if a patient specimen is infected, remains largely manual. The major requirement for computer assistance in this situation is not equipment automation but rather information management.

With this insight in mind, I wrote MICROBE, a system of eight programs, to handle the data input and reporting functions of the microbiology laboratory at the University of New Mexico Hospital/Bernalillo County Medical Center. The present version of MICROBE has been in use for about 9 months. I wrote it specifically to take advantage of the XT's 10 megabytes of data storage, speed of operation, and versatile function keys. The system's specific operations are separated into modules. MICROBE's capabilities include specimen accessioning, results entry, quick search for recent results, extended search for investigations such as epidemiology and cumulative sensitivities, modification and deletion of records, purging of negative data, backup of old



data to cumulative files, and generation of worklists sorted by type of test or culture.

The microbiology section receives approximately 150 cultures per day and averages 40 positive results. Each culture is identified by a unique accession number, the patient's name, the location within the hospital, and the source of the specimen. Previously this information was entered into log books by hand, but now the specimens are logged through the lab with MICROBE's accessioning module, which is invoked from the main menu. This module recovers a few common variables

from a CONTROL file maintained on the disk. The CONTROL file contains the last logical record numbers used in the data files and the last accession numbers used for each type of culture or test.

Accessioning, like all of the MICROBE modules that require keyboard input, employs an input template to maximize the accuracy of data entry (see Figure 1). The valid input for each field is different, so a prompt appears on the last six lines of the screen to remind you of the restrictions or type of input expected.

When the code identifying the type of test is entered in the accession number field, the program displays the next number for this test series and waits for you to press a cursor movement key or the Enter key. The source codes are a set of 85 anatomic locations used to describe the site of origin of the specimen. After you have typed the second digit of this code into its field, the text translation immediately appears below it.

The input screens are made flexible by a subroutine, initiated with the F10 key, that reads data directly from the screen and validates it. The routine itself is very short, as shown in Figure 2. It requires only the row, column, and length of the input field on the screen, and it calculates the offset into video RAM. PEEK is used to exam-



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**CIRCLE 318 ON READER SERVICE CARD**

## SCIENCE

Accession No.: ....						
Name: .....						
Hospital No.: .....						
Ward: ...						
Source Code: ..						
MIC	PIC	SIC	NBI	NBN	ER	B&T
3W	3E	48	4W	5W	58	5E
OP1	OP2	OP3	OP4	OP5	L&D	M&I
CT	FPC	ARF				
F1 Main Menu			F10 File Data			

Figure 1: Accession module input template. The prompt displayed is for field 4.

```
10000 SCLEN$= LENGTH(CUR$): ROW$= Y$(CUR$): COLMN$= X$(CUR$)
10010 START$= ((ROW$-1)*160)+(2*(COLMN$-1)): STP$ = START$ +
((SCLEN$-1)*2): SCREEN$=""
10020 FOR I = START$ TO STP$ STEP 2
10030 S$ = CHR$(PEEK(I)): IF S$= "." THEN 10040 ELSE SCREEN$=
SCREEN$ + S$
10040 NEXT I: RETURN
```

Figure 2: This subroutine reads data from the screen and validates it where possible.

ine the locations, the values are converted from ASCII codes to letters using the CHR\$( ) function, and the results are concatenated as the response string for the field. Video memory begins at location 0B000H for the monochrome display and is 4,000 bytes long. Two consecutive bytes are required for each character displayed: the ASCII code for the character and the "attribute" of that character (for example, reverse video, bright or normal intensity, blinking or not).

For our purposes, only the character code is important, so the routine examines only the even-numbered bytes. Each field is examined in turn, and the routine assigns the data it reads from the screen into unique string variables upon return. After the subroutine reads the data from the screen, it validates each field if possible. If it discovers an error, it positions the cursor in the correct field and displays an error message in the prompt lines.

The time required to obtain microbiologic test results varies from a few hours to

6 weeks, depending on the type of test. Most results are negative, but those that are positive may have multiple organisms. The Results Entry module accommodates all of these situations. We report the negative cultures for a particular day as a batch by entering only the accession numbers via the keyboard. Into each record the program locates, it places a negative code in the Organism field as well as the current date and time in the Date Out field. If the program misses some records, it generates a printed list of "lost" records so that corrective action may be taken.

We enter positive results individually by specifying the date received and entering the accession number. When the program finds a record, it displays it for confirmation, which must occur before results can be entered. The program automatically places time and date in the Date Out field and positions the cursor in the Organism field. You can then enter codes for the organism, the amount of growth, and sensitivities to antibiotics.



The organism codes are local codes ranging between 100 and 500, with the value 550 reserved for negative results. After you have entered the third digit of this code, the test translation appears on the screen and you can correct it if necessary. Antibiotic sensitivities are recorded using a 1,2,3 code representing resistance, sensitivity, and intermediate sensitivity, respectively. Certain organisms have been designated locally as epidemiologically significant, and any organism isolated from the fluid surrounding the brain is deemed significant. The program notes and flags these events on the record, and the notes may be retrieved later.

Multiple organism isolates from one specimen are recorded by pressing the F8 key. The positive record that the program last located will appear with its result fields blank.

No matter how carefully you enter the data, mistakes will eventually creep into any database. The modification module allows you to correct errors or even delete data from the system. In addition, slow growth of some organisms in a culture may require the addition of further data in the Organism field after the primary results have been entered; the modification module allows for this also.

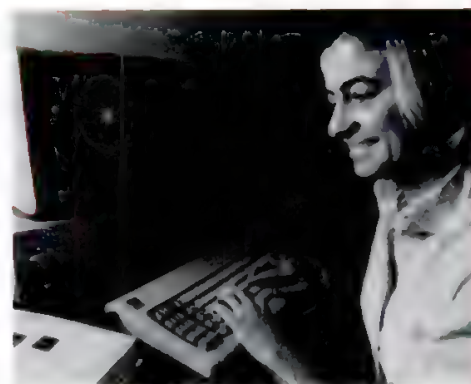
An input template similar to the accessioning screen lets you specify multiple search keys in order to locate a particular record. The program will display records matching the criteria on the screen. You select the proper record by positioning the cursor with the arrow keys and then pressing F5 to begin the modification sequence, which allows you to delete, change, or add to the displayed record.

I wrote the MICROBE database to accomplish several goals: ease of use for computer novices, flexible input, and input verification. In the next issue, I'll explore the versatility and power of MICROBE's data retrieval modules. ■

*Dean Madar is a resident in pathology at the University of New Mexico Hospital/ Bernalillo County Medical Center.*

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The courseware appears to be written in Pascal and runs—ironically enough—not under PC-DOS but under the UCSD p-System. It consists of four disks and a 69-page, spiral-bound reference guide, which is divided into five major sections: Introduction, User Instructions, Keyboard Function Reference, DOS Command Reference, and Exercises.

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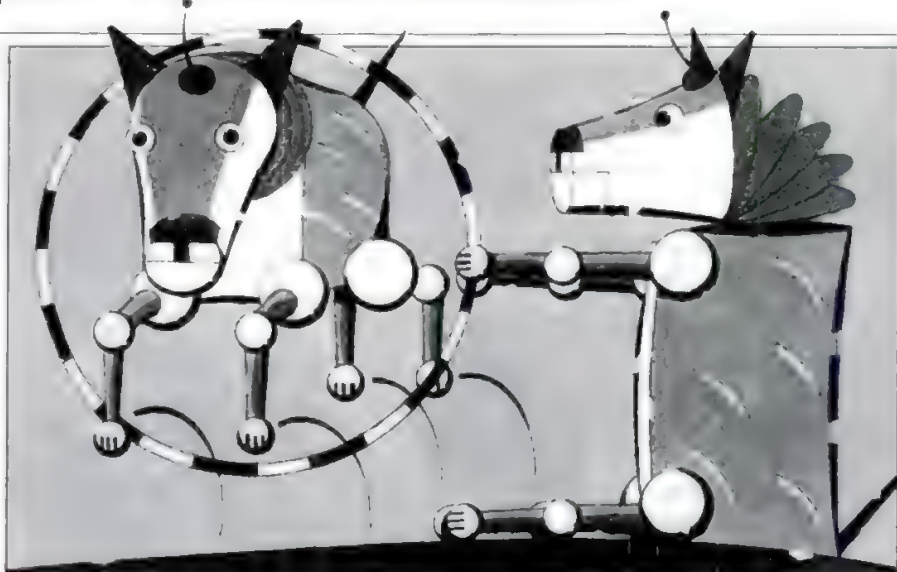
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Each major section begins with a summary display previewing the topics to be covered. The basic structure of each section is a tutorial followed by a brief quiz consisting of one to six questions, typically multiple choice. In some quizzes the program will supply the correct answer after several wrong responses. In other cases, however, you can arrive at the correct answer only by a process of elimination. Hint, Skip, and Review options are

available in some but not all questions.

The program's organization and physical layout are its strong points. The main menu allows direct access to and return from all sections. No selection order is prescribed or enforced; you can choose sections in any order and return to them as frequently as you desire. The display format is clean, consistent, and well organized. Every display is labeled with the name of the section and the current topic. Available options appear across the bottom of the screen. Option key assignments are usually logical and mnemonic; for example, pressing M sends you to the main menu.

(continued)



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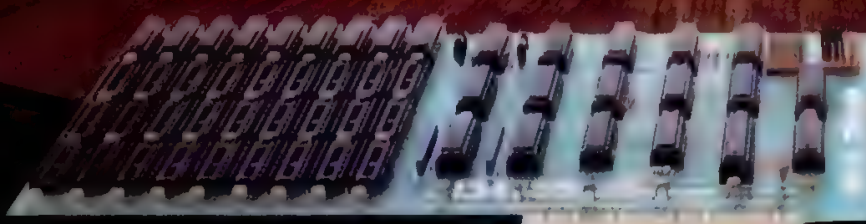


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CIRCLE 266 ON READER SERVICE CARD

## EDUCATION

### One Pace for All

Cdex claims that its courseware allows you to work at your own pace, but all learners proceed through the 11 major sections at essentially the same rate: slowly and straight ahead. Most of the displays permit only forward movement, one display at a time. In tutorials, for example, you page forward, changing displays or adding more text by pressing the Enter key. But there are no backup or browse options, so the merely curious cannot skim, and the experienced user cannot skip ahead.

Reviewing earlier displays is possible but the method is indirect. You can press M to go to the main menu and start the section again, or press R on a question display and return to the beginning of the entire topic. Neither method is convenient; each loses your current place and obliges you to page back to the point of departure. This can be a tedious process, especially if you were well into the section when you lost your place. Moreover, the limits imposed on browsing and reviewing can turn the quizzes into tests of memory, not knowledge.

Where the courseware reaches for depth, it fails because of limitations imposed by the choice of the computer as a medium for content that could have been more effectively presented in print. For example, in explaining the differences between BASIC, Pascal, C, and COBOL, the courseware authors use one model: a program that requests and prints a name. It would be useful to compare each language version side by side, and in a book this would be no problem.

Here, however, the program examples appear on separate displays—in some cases in different sections. Of course, it is not possible to flip back and forth between displays or sections. Consequently, you must remember or record the details. A simple solution would be to put this kind of useful instructional material in the accompanying reference guide, but that text has other uses.

The programmers have limited learner

input to the characters comprised by the specific response. For example, if the answer to a question is the word *run*, you can type only the letters R, U, and N, in any order. If you type any other characters, they won't be displayed. Similarly, if a multiple choice question has four possible answers (A, B, C, and D), only those letters can appear on the screen.

## All learners proceed at essentially the same rate: slowly.

In the quizzes, the program evaluates your responses as soon as you type them in. A more benign approach would be to suspend judgment until you confirmed the answer by pressing a second key, allowing you to correct a mistake or revise an answer.

The feedback tends to be musical and enthusiastic. The program rewards correct answers by writing "Super" in bold letters across the screen, accompanied by a few synthesized notes. In some places, however, feedback is unhelpful. I answered a question in Section J, Operating Systems/Programming Languages, with a variety of incorrect responses:

Indicate which language you  
would choose in each of the  
following situations

- |            |              |
|------------|--------------|
| A. BASIC   | D. COBOL     |
| B. Pascal  | E. C         |
| C. FORTRAN | F. Assembler |

To develop an accounts  
receivable system for a small  
company.

The feedback for answer A was "Sorry. Not a bad choice, but not the one I had in mind. Try again." This is a frustratingly mixed message. Translated, it reads: "Your answer is good, but I won't tell you why. I'm thinking of a better answer. Guess what it is."

Next I chose B and got this response:



"Right. Well, Pascal isn't a bad choice, although COBOL would be good too." I was struck by the almost grudging tone of this "positive" feedback.

The test questions remain unchanged, in difficulty and number, whether your responses are good or poor. In fact, at times the courseware seemed unaware of

my performance. For example, I systematically chose the wrong answers to one question. On the third try I chose the correct answer, eliciting this flattering but false feedback: "Well Done. Super. You Must Have Been Paying Attention"—the same message I would have received for a correct response on the first try.

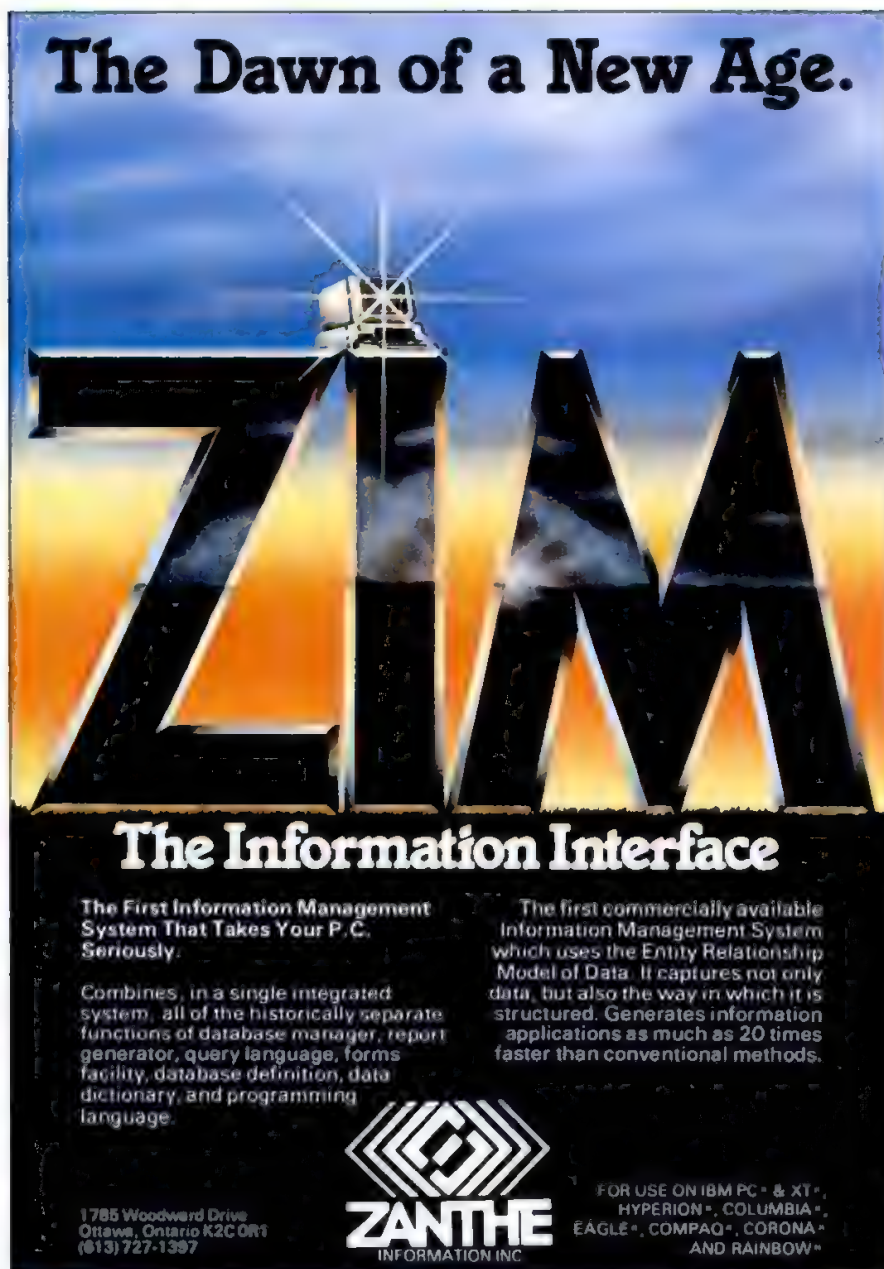
The program does not keep records of quiz scores, so you can't compare your performances between or within sections. If you elect to take the courseware in several sessions, you are responsible for tracking your quiz scores as well as the sections you've completed.

## Rereading the Guide

About 65 percent of the information in the reference guide is already in the hands of IBM PC owners, and in more detail. The guide is simply a selective summary of the PC-DOS manual, BASIC manual, and *Guide to Operations*. It has an incomplete list of DOS commands (batch and advanced commands are omitted) and abbreviated descriptions of them.

The last section of the reference manual contains eight exercises to be completed after you finish particular sections on the disks. This material is potentially valuable, since its goal is to guide you in actually using DOS. First, each exercise outlines a procedure (for example, display the directory on drive A: in multiple columns). Then, on a separate page, it describes the steps you would take to perform the procedure. My only criticism of this section is its brevity. More of this approach would enhance the educational worth of this package immensely.

The problem of *How to Use Your IBM Personal Computer with PC DOS* is that it is courseware in the worst sense of the word. It barely exercises the computer's potential as an instructional medium. Interactive courseware, which this program claims to be, should actively engage the learner's attention. This program, however, doesn't require very much—certainly not enough to justify presenting the material on a micro and not in a book. ■




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CIRCLE 210 ON READER SERVICE CARD

# The PC Remedy For a Hospital's Ills

A health care center's leisurely transition to in-house PCs became a trial by fire. Here's how St. Benedict's made the switch under less than ideal circumstances.

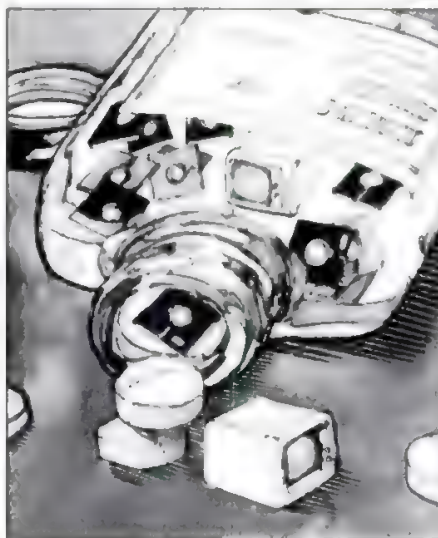
**A**t St. Benedict's health care center in San Antonio, Texas, accounting functions were handled for years by a semi-automated mix of monthly computer reports from a service bureau and manual bookkeeping. Two different computer service bureaus maintained the accounting and payroll files. Financial statements were generated with a desktop calculator.

When the service bureau went bankrupt a year ago and left the center stranded, business manager Dan McKnight's department resembled a hospital accountant's version of St. Elsewhere. Today, the turmoil has largely been brought under control with the help of four PCs linked by a Corvus Omninet. That hardware roster was recently expanded with the addition of an IBM Portable PC.

## Budget Battles

McKnight has been going to the mat for the past 4 years with one of the toughest CEOs ever to control a purse string. Each June he must submit a budget outlining the needs, including data processing, of the accounting department at St. Benedict's. The proposed budget circulates among the hospital's Finance Committee before reaching the scrutinizing eye of Sister Mary John, the chief administrator.

Since taking the helm a decade ago, Sister John has guided St. Benedict's from



a hospital and nursing home serving the aged poor to a community-based health care microcosm. The accounting department budget—and in particular computer purchase requisitions—never fares well against her humanitarian concerns.

Despite the diverse factions competing for the tight budget, St. Benedict's administrators finally agreed in 1982 that the accounting system was no longer keeping pace with the health center's growth. After evaluating other alternatives, they approved the purchase of an in-house computer. In-house computing capability had the attraction of flexibility, quality control, and quick turnaround, but the diversity of the accounting procedures present-

ed a dilemma. Where would the software to handle the accounting requirements of the myriad services come from? Off-the-shelf software packages existed for hospitals, nursing homes, and physician's charges, but none of these packages integrated the distinct functional areas. Hiring a team of programmers to write custom software would solve the problem, but the expense would be prohibitive.

The software problem was solved when one member of the Finance Committee casually mentioned the problem to an associate who taught computer science at nearby Trinity University. Why not let Trinity's graduate students write the custom software, the professor suggested. Students, after all, are always looking for practical experience. Trinity would grant course credit for the work, and St. Benedict's could use the finished programs at no cost other than the time involved in dictating the requirements.

Trinity and St. Benedict's reached a deal and resolved the software issue. Next, the Finance Committee concentrated on hardware. After evaluating several computers, including systems from Burroughs and Wang, St. Benedict's invested in the four PCs and a Corvus Omninet with a 20-megabyte hard disk.

The delivery of the PCs was scheduled for early 1983 to correspond with the availability of the custom software. Six



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## MEDICINE

computer science students spent the fall semester of 1982 laying out a detailed plan for automating the accounting procedures. They would begin programming in the next semester and planned to complete the first major component that spring. As the programs were brought on-line, McKnight planned to run them in parallel with the existing system for 3 months in order to audit the output of the PCs while maintaining the existing records in case of snags.

### The Setup

When the equipment arrived, three of the PCs were set up in the accounting and financial departments. One PC equipped with 1-2-3, WordStar, and a NEC letter quality printer was placed in the office of the chief financial officer for budget reporting. Two others were configured

with dot matrix printers and assigned to the accounting department where six employees would alternately post patient charges. The remaining machine was reserved for programming and testing new applications.

With the hardware installed and the software advancing on schedule, McKnight hoped that the conversion to the PCs would be nearly complete within 6 months.

The well-thought-out plan for parallel operations never came to fruition, however. One day soon after the PCs were delivered, a van-load of computer listings appeared at St. Benedict's receiving dock. The service bureau that processed accounts receivables and payables had gone bankrupt. "They gave us our last 30 days work in a box and walked away," McKnight recalls.

The demise of the service bureau transformed the unhurried conversion into a full-speed-ahead effort to bring programs on-line. St. Benedict's hired a programmer to expedite the software development process. McKnight, meanwhile, put the accounting department on overtime to generate bills manually until the software could be pieced together.

The programmer worked closely with the Trinity students in testing and installing applications written in Microsoft COBOL. First to come on-line was the patient charging and billing system.

Besides generating revenue through timely billing, the patient-charging system immediately cut time and expense in several areas, most notably the Medicare gateway program. This program connects the PC via a modem to mainframe computers in Dallas maintained by EDS, Inc.,

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CIRCLE 153 ON READER SERVICE CARD



## BUSINESS

to process Medicare claims. An IBM 3270 adapter card in the PC handles the communications protocol.

After the 3270 link and other billing programs were up and running, the programming team turned its attention to the patient payments system. While McKnight was waiting for this part of the system to be developed, he learned 1-2-3 in order to process financial reports. "That program is worth ten times its price," he lauds.

### Consider These Caveats

In other applications areas, McKnight purchased canned software as "survival tools" to tide the conversion over until the accounting department is ready to write its own programs. IBM's general ledger and accounts payable packages temporarily handle a major part of the workload.

Nonetheless, McKnight has less than kind words for this package, which had several problems in Version 1.0. "We learned about them through long, hard experience," he says. "Be sure to get Version 1.1 if you buy it."

McKnight has other caveats for health care administrators considering a PC approach to hospital accounting. "Be prepared for hardware failures," he says, tapping a PC cabinet. "We've replaced virtually every disk drive. This gets to be expensive, especially after the warranties expire."

Purchasing supplies proved to be another unanticipated expense. "As soon as you add the word *computer*, the cost doubles," McKnight laments. "This includes paper, printer ribbons, and even ordinary tables. Shop around for the best prices. For example, we cut diskette

expenses by 40 percent by purchasing through a discount vendor."

The high cost of repairs and supplies is partially balanced by savings in the purchase of a hard disk backup system. The entire 20 megabytes of the Corvus hard disk can be copied using an off-the-shelf videocassette recorder at a fraction of the expense of magnetic tape drives designed for computers.

Over the past year, St. Benedict's accountants have received a virtual baptism by fire on operating PCs. What started as a leisurely conversion turned into a red-alert. McKnight originally thought that programming skills and hardware knowledge would be the main factors determining the success or failure of the computer endeavor. Looking back, he says, "Our management abilities were the most important factor all along." ■

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\*IBM STYLE A Fits IBM-PC, XT, COMPAQ and LEADING EDGE

\*\*IBM STYLE B Fits COLUMBIA, OLIVETTI, CORONA, TAVA, IVY, PRONTO, SILICON VALLEY MICRO, NORTH STAR, DIMENSION, LOGICAL, L-XT, IMP and SPERRY-PC



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# Micro Insurance

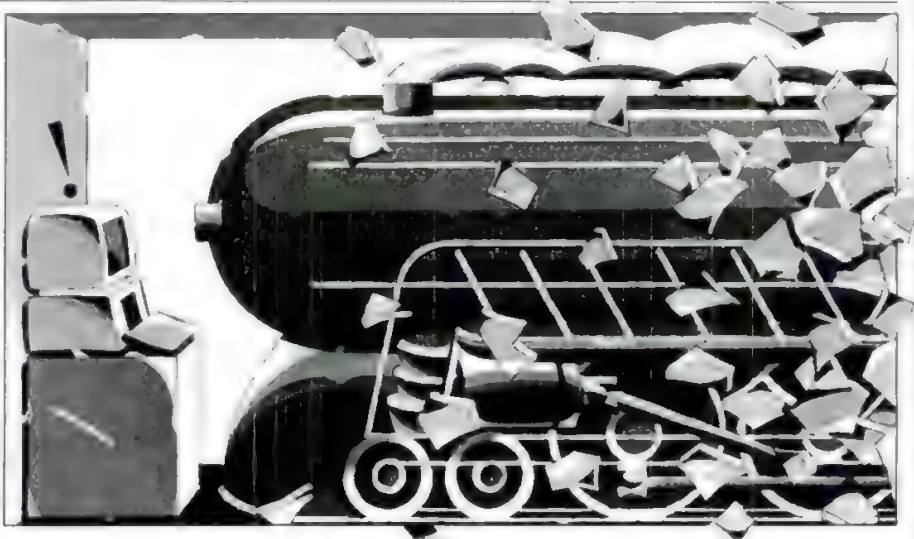
How and for how much should you insure the computers that you and your company depend on? Insurance firms provide a variety of ways to keep your micro covered.

**I**nsurance for personal computers is a much-ignored and little-understood offshoot of the recent technological boom. Yet both homebound micros and office desktop systems require some form of coverage. Newly created policies, designed primarily for businesses, are now adjusting coverage to include these traditionally excluded dangers.

For individuals who use their PCs for purely personal purposes, the options are relatively straightforward. Most insurance companies offer special riders to existing homeowner's policies, designed to cover the additional expense of the computer itself. Some policies provide a "replacement cost" endorsement instead of an "actual cash settlement" that would deduct for depreciation.

## Numerous Exclusions

A floater policy can be written to include a broader range of perils, but most riders still cover only those mishaps that could be incurred by any household article. Such mishaps include fire, theft, vandalism, riot or civil commotions, collapse of building, falling objects, airplane crashes, and burst pipes. Exclusions are even more numerous, including loss of income, programming errors, mechanical breakdowns, electrical hazards (except lightning or those that result from fire), wear and tear, and vermin.



A typical computer endorsement like this will run about \$36 per year for extended coverage of \$7,500. However, if you use your PC for any business at all, a mini-computer policy (which includes micros) may be worthwhile. The Travelers Insurance Company offers all-risk coverage that excludes only the damage of wear and tear for \$5,000 on a minimum premium of \$250. Nationwide and Liberty Mutual provide policies with smaller premiums but longer lists of exclusions.

These forms of coverage apply only to hardware. Software, in insurance parlance, is divided into "data" and "media." Data refers to all programs and electronically-converted information stored on

magnetic tapes, disks, drums, or cards; media are the physical materials on which the data are recorded. Occasionally a policy will cover the cash value of the media, but the data, by far the more expensive component, is usually excluded.

However, some companies, such as Safeco, have introduced special home computer policies that cover both hardware and software. Its policies include damage to the equipment anywhere in the world, which is important for portable PC owners. Exclusions are few, primarily covering electrical and magnetic disturbances and programming errors.

The Kemper Group, in its Personal Electronic Equipment endorsement, offers



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## BUSINESS

\$15,000 all-risk repair or replacement coverage for exposures normally excluded by standard policies.

Kemper insures for all causes of direct physical loss to the property except wear and tear, insects or vermin, war (including insurrection, rebellion, or revolution), and nuclear hazard.

Maryland Casualty recently issued a smart home computer endorsement to its homeowner's policies. Written with a \$50 deductible and a separate liability limit over the personal property ceiling, this rider covers nearly all perils for hardware, software, peripherals, and add-ons.

### The Insurance Business

For businesses there is a rapidly expanding variety of insurance options. Some firms simply include their computers under standard property policies. The preferred methods of special treatment include an all-risk Electronic Data Processing (EDP) policy or a Difference-in-Conditions (DIC) policy with an EDP form attached.

Many DIC policies are shot through with exclusions in vulnerable areas, such as damage due to environmental features, dust, and rust. These perils should be covered. Some policies insure against losses caused by mechanical failure and electrical disturbances but are only written with a deductible of as much as \$10,000.

Where software is concerned, there is usually a strict limit on the insured value of media materials, and this is only for their cost in unexposed form before programs or data are added. To reconstruct the lost data, companies can generally recover no more than \$1,000 per occurrence. Whatever software coverage is provided cannot be used as a substitute for Valuable Papers insurance, which you need to cover any supporting documents. EDP policies only cover data in "usable" form, not unconverted source material.

Extra expenses related to data processing failure, such as equipment rental and necessary time-sharing facilities, should be anticipated and covered. So should

business interruption losses. These conditions may be most significant when they involve computerized production equipment. As an exception, Kemper has broadened its Boiler & Machinery Policy to include computers that control mechanical or electrical equipment.

Kemper also boasts perhaps the most comprehensive computer coverage with its Business Electronic Equipment Policy (BEEP). Most standard exclusions—even faulty construction and error in design—have been removed in this \$250,000 all-risk policy.

Electronic thievery is a serious threat for many institutions. Both the Insurance Services Office and the Surety Association of America have issued Computer Fraud endorsements to their Blanket Crime policies. Lloyd's of London, Aetna Life & Casualty, Shand, Morahan & Co., and St. Paul Fire & Marine have created various Electronic and Computer Theft forms either to supplement or act as riders to existing Blanket Bonds.

### Risk Management

Risk management may be the most crucial element in computer insurance. Many common dangers can be avoided through prudent planning and precautionary measures. Something as simple as a surge protector (the Lloyd's-underwritten line of products offered by Electronic Protection Devices, Inc., of Waltham, Massachusetts, includes one) can eliminate the fear of spikes or glitches. Alarms and security techniques should also be implemented.

Other loss prevention methods include installation of halon fire extinguishers, off-premises storage of duplicate media, and contingencies for emergency use of substitute data processing facilities (hot-sites, which are fully stocked working data centers shared by many companies, are suitable backups).

Only by creating a comprehensive risk management and disaster recovery plan can a company determine its loss potential or true risk and develop an appropriate insurance program. ■

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# New On The Market

## HARDWARE

### BUSSter A64R Digital Input Module

A 64-line digital input device that interfaces to the user's system via a standard RS-232 serial port. The device accepts commands from the host computer through its serial port, reads and stores data from up to 64 digital TTL level lines, and then sends this information back to the user's system as called for by the application.

The BUSSter A64R Digital Input Module can be programmed with BASIC commands. The unit's built-in timer and data buffer allow data sampling and collection to occur as a background operation, while the user's system is occupied with other tasks.

(List Price: \$495)



BUSSter A64R Digital Input Module, Connecticut microComputer Inc.

Connecticut microComputer  
Inc.

36 Del Mar Dr.  
Brookfield, CT 06804  
(203) 775-4595  
TWX: 710-456-0052

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### PLAN 2000

A network system consisting of interface cards and software capable of linking up to 255 PCs and devices. The system links clusters of two to four PCs and/or peripherals to a file server—a host PC that can continue to operate independent applications at the same time network functions are processed. Network software allows for printer and disk sharing and offers features such as guaranteed exclusive access to personal work volumes, read-only access to



PLAN 2000, Nestar Systems Inc.

program libraries or information owned by other users, locks to implement multi-user applications, and passwords to protect private information.

The PLAN 2000 system utilizes the Datapoint Corporation's ARCnet token-passing protocol, which can transfer data at rates up to 2.5 megabits per second up to a maximum distance of 22,000 feet between PCs.

(List Price: Two-system  
kit, \$1,995)

Nestar Systems Inc.  
2585 E. Bayshore Rd.  
Palo Alto, CA 94303  
(415) 493-2223

CIRCLE 787 ON READER  
SERVICE CARD

### Group Response System

A hardware/software system that can link up to 60 participants to an IBM PC using individual keypads to in-

put participant responses. The keypads have 12 keys—the numbers 0 through 9, and the words "yes" and "no." This permits responses to questions with a range evaluation, such as "on a scale from 1 to 10," as well as true/false, yes/no responses.

The included software for the Group Response System allows the host IBM PC to immediately tabulate the group responses, producing a color bar chart on the color monitor. Hard copies of individual results can also be made.

Also included with the package are BASIC programs designed to aid instructors who lack computer programming skills to retrieve and analyze response results. Diagnostic software is included to confirm whether the system is installed properly. (continued)



The starter Group Response System package includes all programs and manual, as well as 15 Response keypads.

(List Price: Starter kit, \$1,800; additional keypads \$65)

*Reactive Systems, Inc.*  
40 N. Van Brunt St.  
Englewood, NJ 07631  
(201) 568-0481

CIRCLE 781 ON READER  
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## DP-9725B Color Printer

A color dot matrix printer with software that permits high-resolution dumps of graphics and text displayed on the IBM graphics monitor. The DP-9725B Color/Scribe Printer employs a multiple-pass capability and a four-color ribbon with yellow, magenta, cyan, and black bands. A single color can be selected for each pass of the printer and multiple color combinations are obtained by overlaying single color selections under

software control. The printer can change colors at any point in a printed line.

Four printing modes are available with the printer: enhanced, correspondence, data processing, and graphics. These modes employ either single- or multiple-pass printing, permitting various quality/speed combinations as well as variable colors within a single document. Also standard with the unit are seven character sets, including Swedish, Danish-Norwegian, German, French, Spanish, Italian, and standard American ASCII.

Special features of the DP-9725B Color/Scribe include reverse line feed, speeding color printing of graphics; and automatic control of color selection sequences, which selects overlays from a light to a dark color to prevent color contamination of the ribbon. Internal control codes automatically control color mixing, eliminating the need for



WX 4731 Plotwriter, Western Graphtec, Inc.

the user to program separate overlay control codes to achieve the desired colors.

(List Price: \$1,625)

*Anadex, Inc.*  
1001 Flynn Rd.  
Camarillo, CA 93010  
(800) 4-ANADEx  
(805) 987-9660

CIRCLE 785 ON READER  
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## LITE-PEN

A lightpen capable of functioning on both IBM's monochrome and color monitors. LITE-PEN has a push-tip actuating mechanism at its tapered end. To begin, the user touches the screen with the pen, activating software included with the device. It self-compensates for screen intensities, maintaining a one-dot resolution on the screen.

LITE-PEN includes a four-conductor I/O cable that connects the device to the IBM lightpen interface.

(List Price: \$295)

**Requires:** Joystick adapter.  
*The Lite-Pen Co., Inc.*  
207 S. Hindry St.  
P.O. Box 45255  
Los Angeles, CA 90045  
(800) 634-1967  
(800) 821-7807 in Calif.

CIRCLE 782 ON READER  
SERVICE CARD

## WX 4731 Plotwriter

A four-pen drum plotter capable of creating drawings at speeds up to 8 inches per second (200mm/sec), with pen selection under software control. The device can accept paper in standard 8½ × 11 or 11 × 17 inches in size. Features include soft-touch controls on the front panel.

*Western Graphtec, Inc.*  
12 Chrysler St.  
Irvine, CA 92714  
(800) 854-8385  
(714) 770-6010

CIRCLE 784 ON READER  
SERVICE CARD



DP-9725B Color Printer, Anadex, Inc.



## SOFTWARE

### PCI Cross Assembler

A cross assembler program for the NS16000 32-bit microprocessor. Written in C, the software permits the IBM PC to develop applications programs for systems incorporating the NS16000.

*PCI Cross Assembler* consists of four utilities: Cross Assembler, Cross Link, Debugger, and Librarian. Features of the software include full macro capabilities as well as floating point and memory management support.

(List Price: \$595)

**Requires:** 192K RAM, two 360K drives, PC-DOS 2.0.

*Program Concepts, Inc.*

*P.O. Box 8164*

*Charlottesville, VA 22901*

*(804) 978-1850*

CIRCLE 753 ON READER  
SERVICE CARD

### HFTOOLS for the BASIC User

A machine language module providing BASIC programmers with an integrated set of 22 functions. The functions can be accessed by the user's BASIC program through a CALL command. *HFTOOLS'* functions include printing of the screen, scrolling or clearing windows, determining system configuration, creating specialized character sets, placing an active real time clock anywhere on the screen, using wild cards to access



*PCI Cross Assembler, Program Concepts, Inc.*

files, and turning BASIC's "write verify" function on or off.

(List Price: \$100)

**Requires:** 4K RAM, one disk drive, PC-DOS, BASIC or BASICA.

*H-F Computing Services, Inc.*

*224 Old Orchard Grove*  
*Toronto, Ontario*

*Canada M5M 2E5*

*(416) 482-8195*

CIRCLE 752 ON READER  
SERVICE CARD

### DCROSS

A debugging tool and programming aid for programmers creating *dBASE II* command files. *DCROSS* checks command file structures, produces command listings, and can print cross-references of memory variables, data fields, and *dBASE II* commands used in a file.

*DCROSS* is written in

Pascal, and versions are available for both PC-DOS and CP/M-86.

(List Price: \$39)

**Requires:** 128K RAM, two disk drives, PC-DOS, *dBASE II*.

*Radox 2 Software*

*P.O. Box 1230*

*Loomis, CA 95650*

CIRCLE 751 ON READER  
SERVICE CARD

### THOTH

A database management program containing three directories that allow the user to keep track of large numbers of projects, deadlines, meetings, and other managerial responsibilities. The software's Action List component can list hundreds of projects, meetings, birthdays, important events, and so forth by date and priority. Its menu-driven retrieval system can recall data up to 825 characters per item.

The Note Book component provides a directory of data on projects or personnel by category or subcategory. The user can create text files of up to 825 characters per item. The third component, a People Directory, can be used as an automated card file to keep track of important names and addresses, along with up to 25 characters of text for each individual. The software permits up to 12 entries in the People Directory to be linked to an Action List or Note Book item.

(List Price: \$99.95)

**Requires:** 128K RAM, one disk drive, PC-DOS, color/graphics adapter.

*Xor Corp.*

*5421 Opportunity Ct.*

*Minnetonka, MN 55343*

*(612) 938-0005*

CIRCLE 750 ON READER  
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*Introduction to 1-2-3, Learn-PC Video Systems*

### Format 1-2-3

A utility permitting the user to create Lotus' 1-2-3 spreadsheets from ASCII files and reports. In addition, the program can interface with SAS and SPSS output from a mainframe system, allowing mainframe data to be load directly into the spreadsheet software.

The program can be used with communications software such as *PC-TALK*.

(List Price: \$100)

**Requires:** 64K, one disk drive, PC-DOS.

*Reliable Software*

P.O. Box 849

Marina, CA 93933

CIRCLE 738 ON READER  
SERVICE CARD

### Introduction to 1-2-3

A videotape-based tutorial with software support for learning Lotus' 1-2-3

spreadsheet/graphics program. Participants first watch a 1-2-3 procedure demonstrated on the videotape. The videotaped lessons show exactly what keys to press and how the computer screens should respond.

Then, using the accompanying tutorial diskette and guidebook, the user completes the same procedure on the computer.

Additional diskettes and workbooks are available, allowing the tutorial to be used in classroom applications.

(List Price: \$495; additional workbooks and disks, \$15)

**Requires:** Lotus' 1-2-3.

*Learn-PC Video Systems*

3601 Woodale Ave. S.

Minneapolis, MN 55416

(800) 532-7672

(612) 546-6049

CIRCLE 756 ON READER  
SERVICE CARD

### Word-Jr

A word processing program for the IBM PCjr, consisting of two modules: a full-screen editor and a text processor, *Word-Jr* can support either color or monochrome monitors, and offers a built-in file merge capability.

The software's editor makes use of function keys, and creates true ASCII files. Features include wordwrap, the ability to make global changes within documents, as well as the ability to copy parts of files and move blocks to new locations within a file. The text processing component permits selective printing of form letters from multiple text files, and text formatting commands permitting underlining, bold face, and simulated super- and subscripts. (List Price: \$59)

**Requires:** IBM PCjr; 128K RAM, one disk drive, PC-DOS.

*Micro Architect Inc.*  
6 Great Pines Ave.  
Burlington, MA 01803  
(617) 273-5658

CIRCLE 755 ON READER  
SERVICE CARD

### Exam Builder

A test generation and storage program for educators. The menu-driven program includes the ability to generate tests with random selections of up to 150 questions from any combination of subjects; user-designed test headers; the ability to print master lists of questions and answers; and password-protected answer keys.

(List Price: \$99.95)

**Requires:** 64K RAM, one disk drive, PC DOS.

*A.U. Software*

P.O. Box 597

Colleyville, TX 76034

(817) 267-5236

CIRCLE 737 ON READER  
SERVICE CARD



*Word-Jr, Micro Architect Inc.*



## Windows for C

A screen-formatting program for programmers working in C that allows the screen to be divided into any number of windows, each of which acts as an independent screen. A library of preprogrammed functions provide the ability to clear, write, and control attributes of each window independently; overlay and then restore screens; change the attributes of selected text; and save the contents of windows. Optional wordwrap and automatic scrolling are built into output functions. Line-oriented assembler subroutines provide for rapid screen changes.

*Windows for C* includes C language source modules for viewing of multiple ASCII files within several windows, menu display and selection, cursor control, and drawing text-mode graphs. The library of subroutines allows the rapid building of complete routines.

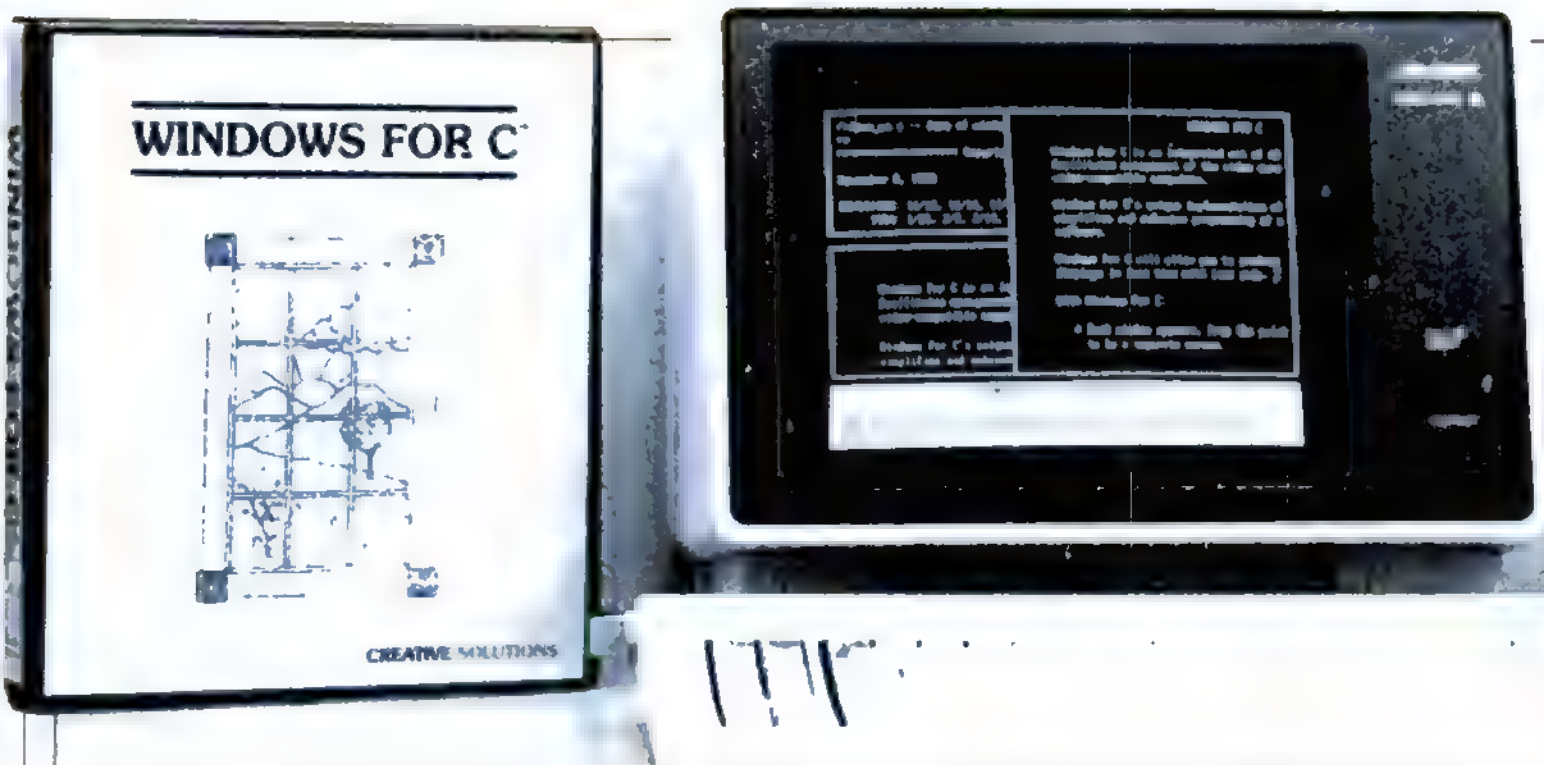
Compilers supported by the *Windows for C* software include C86, Lattice C, Microsoft C, and DeSmet C. (List Price: \$150; Source code \$650)

**Requires:** Depends upon C compiler used.

*Creative Solutions*  
21 Elm Ave.

Richford, VT 05476  
(802) 848-7738

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*Windows for C, Creative Solutions*

## dSOLUTIONS Tools

A set of five software tools for use with the *dBASE II* database management system. The tools, available separately, include a *Multi-Column Report Generator*, *Global Change*, *Versa Label*, *Floppy Tracker*, and *Public Domain Software*.

The *Multi-Column Report Generator* permits the *dBASE II* user to create reports by answering screen prompts. The software allows the user to choose a data file, specify the number of lines per page, specify the number of characters total per line, and specify the fields to be included in the report. The software then generates the appropriate *dBASE II* form file, automatically setting column widths and such. Results can be sent to a display screen, printer, or to a text file.

*Versa Label* allows the

user to store up to nine different label formats for use with a data file. The user chooses the file and starting record from which to print, the number of labels for each record, the number of labels across a page, the label width, the number of characters per inch, and the total label count. When it encounters a blank field, the program will automatically shift up succeeding lines on the labels printed.

*Floppy Tracker* provides the user with a *dBASE II* file directory for each disk containing data files. The directory lists a disk reference number, the date created, primary user user, file name, file extensions, and comments on the file contents. The remote directories (one for each disk) can be referenced at any time through a master directory file.

*Global Change* permits

the user to automatically search-and-replace character strings within database files. The software allows the user to choose a file, specify the field to search through, specify the replacement string, and pick the record number on which to start.

The *Public Domain Software* module of *dSOLUTIONS* offers sample programs written in *dBASE II* that can be modified by the user for specific applications. Offered in the module are the sample accounting program described in the *dBASE II* manual, a form letter generator, a mailing label manager, and a sophisticated file backup routine.

Each *dSOLUTIONS* tool is available separately, and contains source code which can be modified for particular needs.

(List Price: \$39 each)



## SOFTWARE

**Requires:** 128K RAM, one disk drive, PC-DOS, *dBASE II*.

*Data Based Solutions*  
1975 Fifth Ave., #105  
San Diego, CA 92101  
(800) 336-6060

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### VALUE/SCREEN

An investment analysis program, capable of sorting through thousands of stocks for those that meet up to nine user-selected criteria for investment. The program offers an array of 32 investment variables from which to choose those that meet the user's objectives. Variables offered include critical statistics, projections, and performance rankings of stocks selected by the user.

*VALUE/SCREEN* is bundled with Value Line data disks, which list pertinent information for 1,650 stocks, nearly 50,000 statistics, on a single diskette. Monthly updates for one year of the Value Line data disks are provided to users of *VALUE/SCREEN* as part of the software package.

(List Price: \$495)

**Requires:** 64K RAM, one 320K drive, PC-DOS.  
*Value Line, Inc.*  
711 Third Ave.  
New York, NY 10017  
(212) 687-3965

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### PFS:PROOF

A one-step proofreading program with a 100,000 word dictionary. The program has been designed to work with the *PFS:WRITE* word processing program but can be used with any ASCII word processor.

**Requires:** 128K RAM, two 320K drives, ASCII word processor.

*Software Publishing Corp.*  
1901 Landings Dr.  
Mountain View, CA 94043  
(415) 962-8910

CIRCLE 778 ON READER  
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*PFS:PROOF*, Software Publishing Corp.

The menu-driven program leaves the original text unaltered except for spelling or typographical errors. It flags misspelled words in a document, providing the correct spelling rather than requiring the user to look up the word as a separate operation. It also checks for irregular capitalization, double words and typographical errors, and allows all corrections to be made with single keystrokes.  
(List Price: \$95)

### ConceptVP

A window-oriented operating environment permitting concurrent use of any number of applications programs. *ConceptVP* makes use of pop-up menus, prompt lines, status information, and on-line help screens. Data from any of the applications programs can be exchanged between programs, and composite reports can be generated.

(List Price: \$350)

**Requires:** 256K RAM,

two disk drives.

*Scientia, Inc.*  
40 Grove St.  
Wellesley, MA 02181  
(617) 431-7184

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### The Label Maker

A flexible label-making program for Okidata printers, containing printing formats for several commonly used label applications. *The Label Maker* can produce bar code labels, mailing labels, inventory or bin labels, product labels, and price tags. For more specific applications, the software allows the user to custom-format labels according to need.

Data for the labels can be entered at the keyboard or taken from data files as large as 35,000 records, each of which can be 256 characters long, divided into up to 50 fields. Only one master data file need be created to print out different types of labels.

*The Label Maker* can produce seven different character sets, including bar codes in several different densities and heights, and ASCII characters of three heights and widths. Any of the seven character sets can be printed on the same label in any combination. Up to 50 lines can be printed on a single label.

(List Price: \$395)

**Requires:** 64K RAM, one



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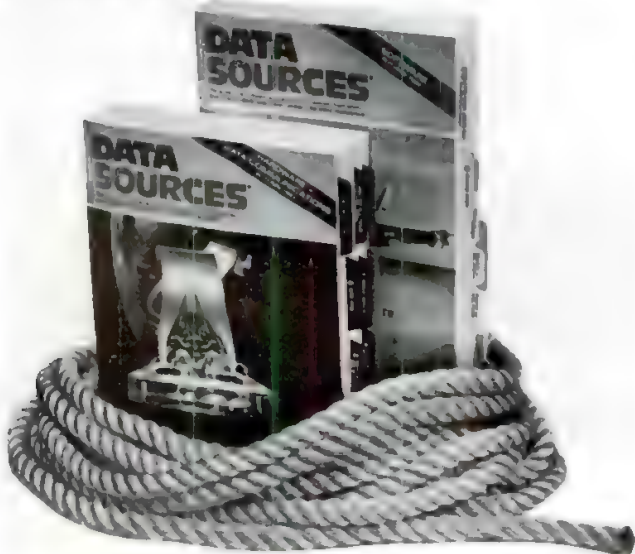
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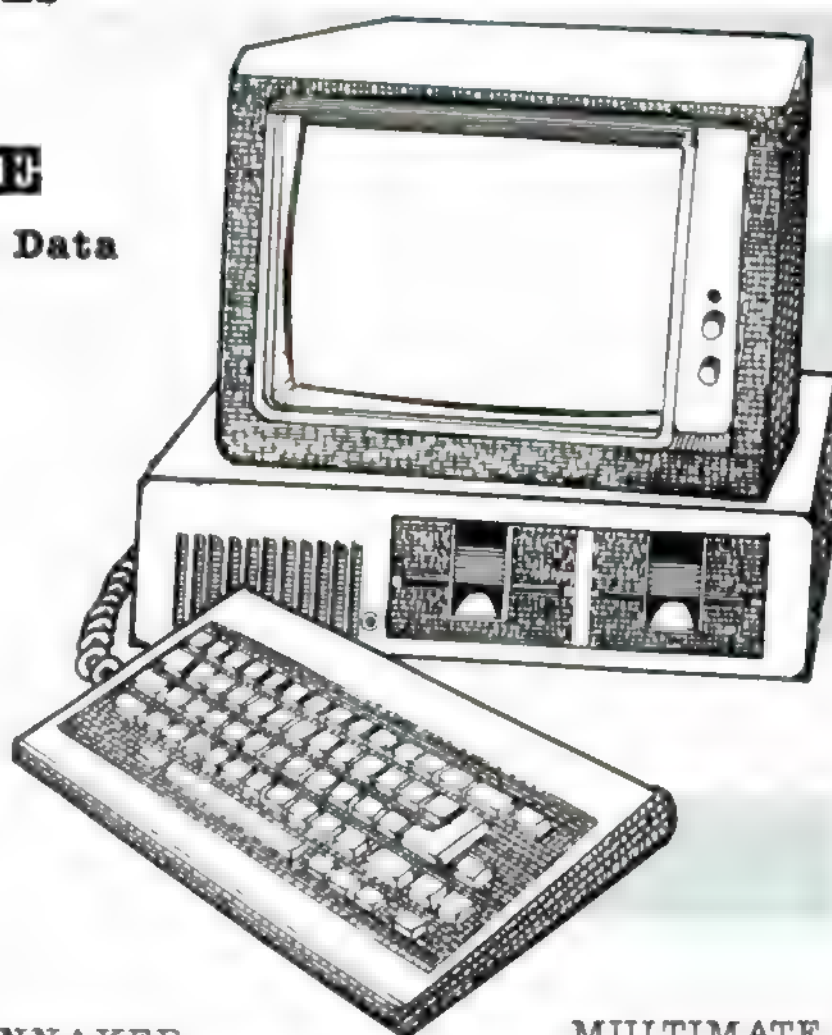


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### Wordfix

A text file conversion program that can take *WordStar*-encoded files and remove all special codes without programming. The resulting ASCII file can be read by any other word processing, communications, or data management software.

(List Price: \$49)

**Requires:** 64K RAM, one disk drive.

*Markets International Software*  
8285 SW Nimbus, #130  
Beaverton, OR 97005  
(503) 641-7072

CIRCLE 775 ON READER  
SERVICE CARD

### Excelerator

A program automating many of the manual tasks performed by mainframe software systems analysts. *Excelerator* assists the professional analyst in all phases of system breakdown, design, organization, and documentation. It utilizes a menu-driven structure, graphics, a data dictionary, and word processing capabilities to aid the analyst in meeting deadlines.

Beginning with the software's diagramming facili-



*Excelerator, Index Technology Corp.*

ties, the user can design enterprise models, data-flow diagrams, structure charts, record and field layouts, screen definitions, and report layouts. Via a link to an outside word processing program, users can generate narrative descriptions of the system design.

In its graphics mode, the software can automatically draw over 20 objects including process boxes, external data entities, data stores, offpage connectors, and function boxes. It will also draw different types of connections between these objects. Objects can be added, deleted, or repositioned on-screen through the use of a mouse; connections are automatically redrawn.

The initial release of *Excelerator* is configured for

the IBM PC-XT, and includes additional plug-in boards to increase the XT's memory and enhance its graphics capability. The software also employs a digital mouse for rapid screen design and menu selections.

(List Price: \$9,500)

**Requires:** PC-XT: 256K RAM, one disk drive and hard disk, monochrome monitor.

*Index Technology Corp.*  
5 Cambridge Ctr.  
Cambridge, MA 02142  
(617) 491-7380

CIRCLE 779 ON READER  
SERVICE CARD

### STATPLAN

A statistical analysis and data manipulation program featuring a full-screen editor that utilizes the IBM PC's

function keys. Function keys are used to enter and edit data and to initiate a data transformation routine that does arithmetic functions on data, including taking the logarithm, lagging, leading, smoothing, and finding first differences within data. Results may be displayed or printed in either tabular form or as cross plots, histograms, or time series plots.

*STATPLAN* can read and write Data Interchange Format (DIF) files, allowing transfers of data to and from many spreadsheet programs.

The program's statistical routines include basic descriptive statistics, correlation matrices, one-way analysis of variance, autocorrelations, and multiple regression analysis. The latter function displays residuals of the regression as tables or graphs, and can use calculated values in subsequent regressions. The program can automatically produce forecasts using the regression equations.

*STATPLAN* guides the user through each procedure by listing available options on the screen.  
(List Price: \$49.95)

**Requires:** 64K RAM, one disk drive, PC-DOS.

*The Futures Group*  
76 Eastern Blvd.  
Glastonbury, CT 06033  
(203) 633-3501

CIRCLE 767 ON READER  
SERVICE CARD



**WindowMaster**

A multitasking operating system enhancement for PC-DOS that permits the user to place several applications on screen at one time through the creation of windows. In addition, the software incorporates utilities that permit CP/M-86 programs to run concurrently with DOS software. Windows are opened simply by naming an application program; size, placement, and application of each window is defined by the user.

*WindowMaster* allows the user to create bar or pie charts and line graphs of data in files without an additional graphics program. The menu-driven program can transfer data between

applications and allows the user to define function keys to perform repetitive tasks. More complex tasks between different applications can be performed through user-defined command files, called scripts.

The software contains comprehensive help screens that define each menu selection. In addition, safety features incorporated in *WindowMaster* prevent data loss or corruption through inadvertent shutting down of a system while an application is running. At any time, the user can request status information about applications running under the windowing system, including how much RAM storage each application is using, how

much is still available for other applications, and whether any application is waiting for input from the user.

(List Price: \$295)

**Requires:** IBM PC-XT:

256K RAM, two disk drives, PC-DOS 2.0

*Structured Systems Group, Inc.*

5204 Claremont  
Oakland, CA 94618  
(415) 547-1567

CIRCLE 760 ON READER  
SERVICE CARD

**ICS Travel Expense Accounting & Control**

A program permitting users to account for and control all travel and related expenses, including employee

advances, reimbursements, and relocation costs. The system is based on software originally created for use on mainframe and minicomputer systems.

(List Price: Monthly rental \$225)

**Requires:** 256K RAM, two disk drives, PC-DOS.

*Interactive Computer Systems*

Park II W., Rt. 102  
Londonderry, NH 03053  
(603) 432-3211

CIRCLE 766 ON READER  
SERVICE CARD

**ACCESSORIES****Ergotron Pedestal Base**

A monitor pedestal capable of supporting units weighing up to 70 pounds. The base incorporates a proprietary tilt-friction system which eliminates the need for pins, levers, knobs, or other devices to position the monitor. With one hand, the user can tilt a monitor 15 degrees up or down and turn it 180 degrees in either direction.

The base also features a cable anchor to help prevent wear of signal and power cables.

(List Price: \$149.95)

*Ergotron, Inc.*

P.O. Box 17013  
Minneapolis, MN 55417  
(612) 724-4952

CIRCLE 774 ON READER  
SERVICE CARD



*Ergotron Pedestal Base, Ergotron, Inc.*



### Aegis Line Saver, Model LS-240

A standby uninterruptible power system (UPS) designed to provide 240 watts of backup power for up to 10 minutes under a full load. The unit also conditions line power, incorporating four Spike-Spiker voltage surge protected outlets. Other features of the model LS-240 unit include audible and visual power failure warning, test mode indicator and switch, sealed rechargeable 12-volt battery, replaceable external fuses, and a 6-foot ground line cord.

(List Price: \$485)  
Kalglo Electronics Co., Inc.  
6584 Ruch Rd.,  
E. Allen Twp.  
Bethlehem, PA 18017  
(215) 837-0700  
TWX: 510-651-2101

CIRCLE 773 ON READER  
SERVICE CARD

### Model PC-400 Conditioner

A power line conditioner specifically designed to provide regulated power to a fully configured IBM PC-XT with printer. The Personal Conditioner, Model 400, is rated at 400 volts/ amperes, and filters out voltage spikes, line noise of any type, as well as assuring precise voltage and pure sine wave line power for systems requiring up to 3.33 amps of 120-volt power.

(List Price: \$349)



Aegis Line Saver, Kalglo Electronics Co., Inc. (rear view)

**RTE DELTEC**  
(formerly Gould, Inc.)  
2727 Kurtz St.  
San Diego, CA 92110  
(619) 291-4211

CIRCLE 759 ON READER  
SERVICE CARD

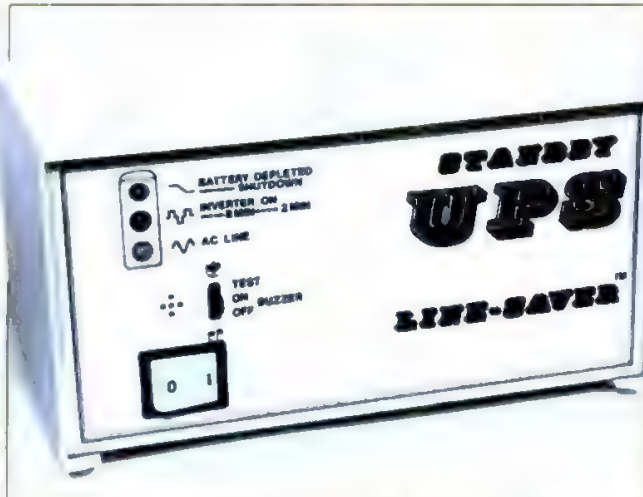
### Compucart

A mobile workstation with space for a PC, monitor, printer, software, and manuals. The unit features a re-

movable back panel, adjustable shelves, and roll-out printer shelf. Large heavy-duty casters allow the unit to be moved as required.

(List Price: \$209.95)  
Electronic Systems  
Technology  
1023 N. Kellogg St.  
Kennewick, WA 99336  
(509) 735-8444

CIRCLE 772 ON READER  
SERVICE CARD



Aegis Line Saver, Kalglo Electronics Co., Inc. (front view)

### UNI-1 Pedestal

A tilt-and-swivel pedestal base that can accommodate any non-IBM monitor. The base is 2 inches high and accepts any manufacturer's monitor that can fit on a 13-inch square. The UNI-1 tilts 22 degrees and swivels a full 360 degrees.

(List Price: \$49.95)  
Curtis Manufacturing  
305 Union St.  
Peterborough, NH 03458  
(603) 924-7803

CIRCLE 758 ON READER  
SERVICE CARD

## PUBLICATIONS

### Advanced dBASE II User's Guide

A follow-up to the publisher's *dBASE II User's Guide*, this book provides the advanced user of the database management systems with a collection of tips, techniques, and practical programs compiled over a 2-year period.

Author Adam B. Green has incorporated practical advice on such areas of *dBASE II* programming as creating macros within macros, controlling program flow, repairing damaged data files, debugging a new application, manipulating strings and numeric data, as well as providing several data models and sample programs.

The *Advanced dBASE II User's Guide* is organized in a manner similar to the



## PUBLICATIONS

original software manuals. New techniques for *dBASE II* commands are arranged alphabetically under the commands for quick referencing.

(List Price: \$29)  
*SoftwareBanc, Inc.*  
661 Massachusetts Ave.  
Arlington, MA 02174  
(617) 641-1235

CIRCLE 763 ON READER  
SERVICE CARD

### PC Accounting Trends (PCAT)

A monthly newsletter devoted to accountants and CPAs using IBM or IBM-compatible microcomputers. *PCAT* offers information on using PCs for conducting audits, tax preparations, client write-ups, and consulting practices. It reports on how CPAs can maximize the uses of personal computers for in-house practice management in such areas as time-billing accounting, staffing, and client databases.

*PCAT* also reports on commercially-available accounting programs, vertical software, and industry-specific applications of the PC.  
(Subscription: \$59)  
*PC Accounting Trends*  
P.O. Box 435  
1850 Union St., #4  
San Francisco, CA 94123

CIRCLE 769 ON READER  
SERVICE CARD

### Simply VisiCalc

An outline of the basic concepts of the *VisiCalc* pro-

gram and a description of how it works. *Simply VisiCalc* provides an overview of the program's capabilities as well as simple examples and detailed illustrations.

Chapters include: "What is the *VisiCalc* program?" "Columns, Cursors, and Coordinates;" "Replication Simplification;" "Performing Plastic Surgery;" "Memory;" "Formats, Functions, and Fundamental Fine-tuning;" "Variations on Values;" "Function Follow-up and Graphs."

The guide helps you do tricks with *VisiCalc*'s labels, formulas, electronic sheets, and columns. It will also show you how to modify its electronic worksheets.

(List Price: \$9.95)  
*dilithium Press*  
8285 SW Nimbus  
Beaverton, OR 97005  
(800) 547-2713  
(503) 646-2713

CIRCLE 770 ON READER  
SERVICE CARD

### Compaq Software Guide

Available specifically for the Compaq and the Compaq Plus portable computers and written by Harold Chambers, *The Compatible Compaq Software Guide* contains a concise history of the Compaq and detailed reports on the software currently available for this IBM PC-compatible.

Software categories covered in the guide include

applications such as accounting and general business, graphics, word processing, spreadsheets. Also listed are personal software and entertainment/educational programs that make use of the Compaq's graphics capabilities.

The book also contains a special section on available enhancement hardware, including reports on expansion cards, printers/plotters, and memory storage devices.

A state-by-state directory of Compaq dealers and a glossary of computer terms make up the appendixes.

(List Price: \$21.95)  
*Prentice-Hall*  
Englewood Cliffs, NJ 07632  
(201) 592-2640

CIRCLE 768 ON READER  
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### Simply dBASE II

An easy-to-follow guide to the *dBASE II* database management system. Chapters include "Why a Database?," "Why *dBASE II*?," "Learning the Lingo," "Change is a Way of Life," "Talking With Your Programs," and others. The guide, by Barbara Chirlian, includes four appendices that provide listings of *dBASE II* commands, functions, configuration parameters, and a glossary of necessary terms.

(List Price: \$9.95)  
*dilithium Press*  
8250 SW Nimbus, #151  
Beaverton, OR 97005  
(800) 547-1842  
(503) 646-2713

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### New on the Market Submission Guidelines

1. Please include the retail price, distribution methods, and details of both hardware and software requirements needed for an end-user to properly use your new product. For software especially, this includes required amount of RAM, number and type of disk drives, operating system(s) supported, and any peripheral equipment needed.
2. Releases should be typewritten double-spaced on one side of the paper. Copies of advertisements for the product may be included, but in most instances we need more information about a product than is typically included in an ad.
3. Include telephone contacts for marketing and technical questions.
4. If available, include black & white glossy photos of the product, 4 x 5 in. or larger.

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Inclusion in *New on the Market* is at the exclusive discretion of the editors.





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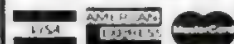
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
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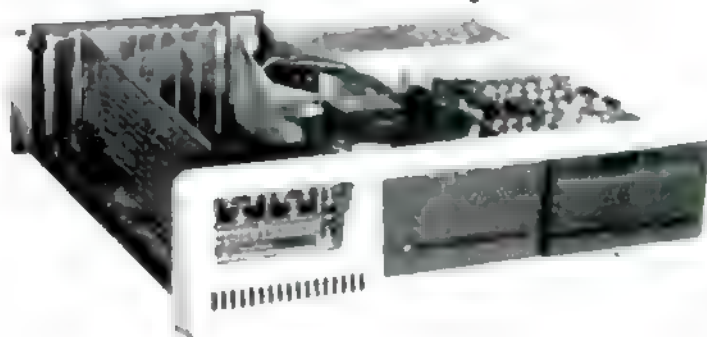
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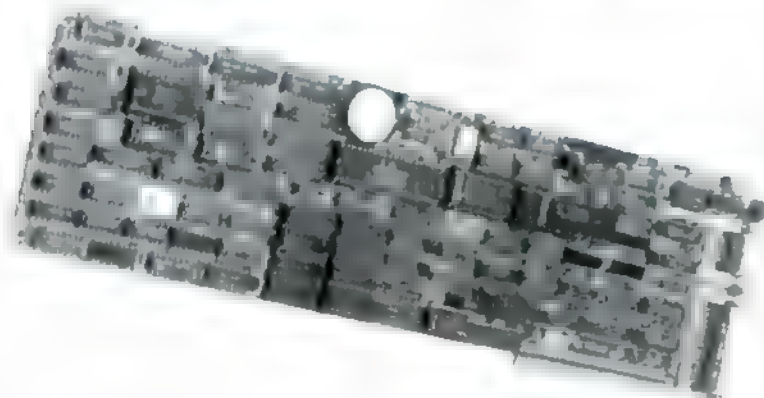
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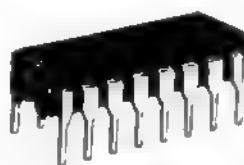
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# PC User Groups

This list is a partial directory of PC user group names and addresses. Use this listing to locate other PC aficionados who congregate in your area or around the world.

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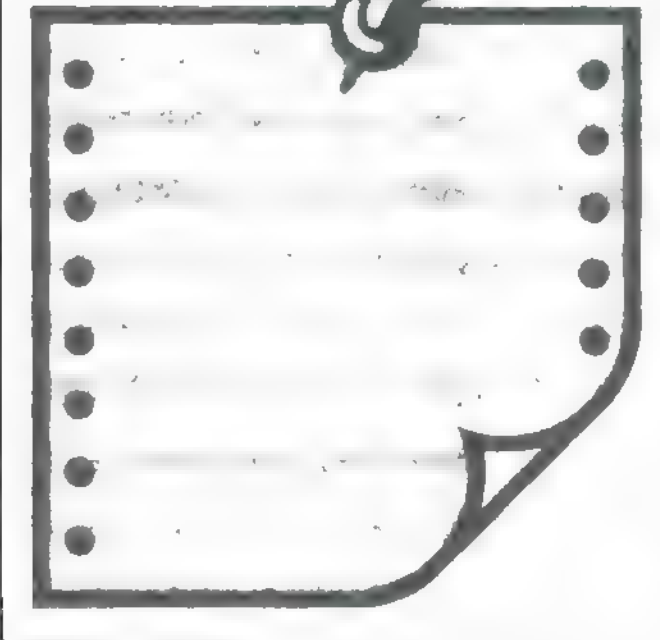
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**IBM PC Users Group of the New York Amateur Computer Club, Inc.**  
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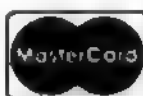
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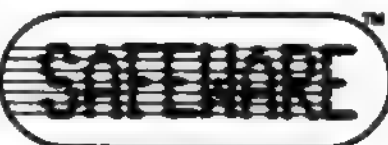
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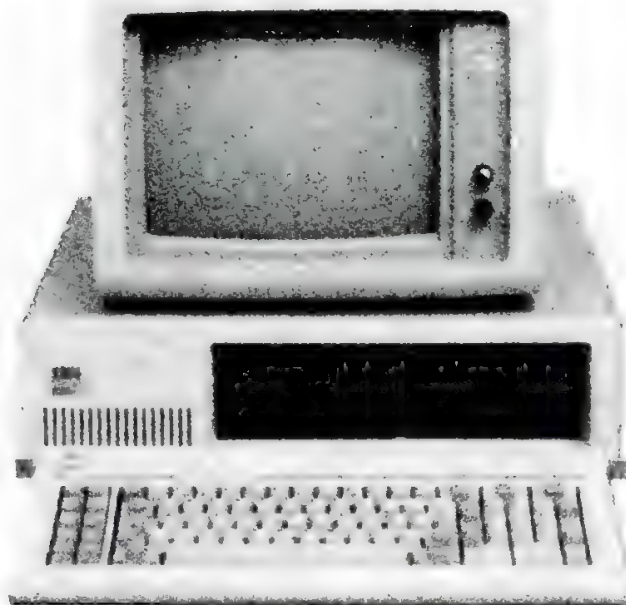
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# Get SET for Speed

The SET command and the environment feature greatly speed entry of DOS commands and filenames.

**T**he SET command is a new feature in PC-DOS 2.0 that many programmers have overlooked. This command lets you set up a table, called the environment, of strings of characters that stand for other strings when used in programs. I've used the SET command and environment feature to create abbreviations for DOS filenames and commands that let me work with fewer keystrokes. For example, after entering the command

```
A>SET D1=\TAXES\DATA
\MARCH\EXPNS\
```

I could type D1 and get the same result as I could by typing the lengthy filename.

Before I could use the SET command this way, however, I had to modify the operating system's command processor, COMMAND.COM. In a previous column ("Enhancing PC-DOS," PC, Volume 3 Number 14), I described how the command processor worked and pointed out where modifications would be made. This time I'll tell you exactly how to use DEBUG to modify COMMAND.COM.

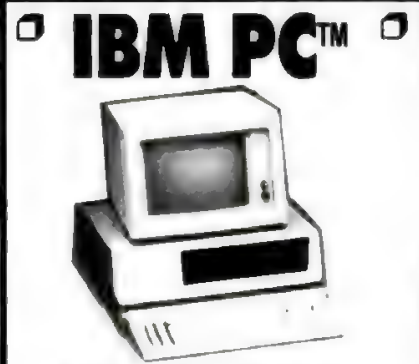
The first step is to add 1,024 bytes to the COMMAND.COM program, which



will give you enough room to insert modified code. These 1,024 bytes are more than enough for the changes I'll describe in this article, so you can use the remainder to add improvements of your own.

Start with a disk containing a copy of DEBUG.COM and COMMAND.COM. (The following instructions assume that you've placed this disk in the A: drive. If you're working with the two files on a hard disk, you must make the appropriate adjustments for the filenames given in this explanation.) Run the DEBUG program and load COMMAND.COM into it by entering

(continued)



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## PROGRAMMING

```
- A 1ED          ; Assemble into memory at location 1EDh.
xxxx:01ED ADD DX,3270 ; Change file-size constant in load procedure.
xxxx:01F1 [Enter]    ; Pressing Return ends Assemble command.

- A 3AD          ;
xxxx:03AD CMP BX,3B0  ; Increase the memory allocation value.
xxxx:03B1 [Enter]

- A 3CD          ;
xxxx:03CD SUB BX,390  ; Subtract 400h from end of memory to get
xxxx:03D1 [Enter]    ; starting segment of transient portion.

- A 691          ;
xxxx:0691 MOV CX,37BE ; Increases count of bytes that are read
xxxx:0694 [Enter]    ; from COMMAND.COM file at load time.

- A 6A9          ;
xxxx:06A9 CMP CX,37BE ; Another increase of the file-size constant.
xxxx:06AD [Enter]

- A C9D          ;
xxxx:0C9D SUB AX,390  ; Subtract again to find starting segment
xxxx:0CA0 [Enter]    ; for COMMAND.COM's transient portion.

- A 140B         ;
xxxx:140B CALL 4030   ; Changed to call our new subroutine -
xxxx:140E [Enter]    ; instead of subroutine now at 1946h.

- M 4030 4580 4430 ; Move the EXEC handler up
- F 4030 442F 0    ; and fill the vacated space with zeros.
- R CX            ; To increase COMMAND.COM file size:
CX 4500           ; Find the current value of CX,
: 4900            ; Increase CX by 400h (1024 bytes greater).

- N COMMAND.TMP   ; Rename COMMAND.COM, since we aren't done yet.
- W              ; Write this file to disk to use in next step.

writing 4900 bytes ; This should appear on the screen.

- Q              ; Quit the DEBUG program. Return to DOS
```

Figure 1: The code required to use DEBUG to expand COMMAND.COM.

A>DEBUG COMMAND.COM

When the dash prompt (—) appears, start entering the code in Figure 1, which will use DEBUG's ASSEMBLE (A) command to change COMMAND.COM. At the beginning of each line in this figure—and on the screen as well—you'll see either a dash prompt or an address such as xxxx:01ED. In this case, xxxx is a placeholder for the number of the memory segment where DEBUG has loaded the file.

Comments follow most of the lines in Figure 1, but you don't have to key them in. After each line, press the Return key. The symbol [Enter] indicates where you should do nothing but press the Return key to finish an A command.

### Creating the Subroutine

By following the instructions in Figure 1, you created COMMAND.TMP—a

version of COMMAND.COM with space between its data work area and the EXEC handler. The next step is to create a subroutine for symbol substitution via the command processor's environment table. This subroutine will be located at offset 4030h in the COMMAND.COM file.

Begin with a disk containing COMMAND.TMP and DEBUG.COM. Place it in the A: drive and type

A>DEBUG COMMAND.TMP

Then start assembling code at offset 4030h. Following the dash prompt, enter

—A 4030

Now, after each address, enter the code given in Figure 2.

When you've finished entering Figure 2, and a dash prompt appears again, write the COMMAND.TMP file back to disk by entering

(continued)



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CIRCLE 354 ON READER SERVICE CARD

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## PROGRAMMING

```

-A 4030
xxxx: 4030 MOV     SI, 2B8B      ; Source: address of user's input.
xxxx: 4033 MOV     BX, 3000      ; Point to temporary buffer area.
xxxx: 4036 XOR     DX, DX        ; This register acts as a flag.
xxxx: 4038 MOV     ES, [2CA0]    ; Get segment address of RESIDENT.
xxxx: 403C ES:     ; In that segment, find segment
xxxx: 403D MOV     ES, [0B1C]    ; address of the environment.

xxxx: 4041 LODSB                ; Here is main loop: First, get a character
xxxx: 4042 CMP     AL, 27        ; from the input, and test for quote mark.
xxxx: 4044 JZ      4065          ; Skip to symbol search (4065) if a quote.
xxxx: 4046 MOV     [BX], AL      ; Otherwise, move input to buffer area.
xxxx: 4048 INC     BX           ; Bump to next spot in buffer.
xxxx: 4049 CMP     AL, 0D        ; See if last char. was end of line.
xxxx: 404B JNZ     4041          ; If not, go back to start of main loop.

xxxx: 404D PUSH    CS           ; This is end of routine, after main loop.
xxxx: 404E POP     ES           ; Get code segment back in ES register.
xxxx: 404F MOV     CX, 0B86      ; Load the address of next routine.
xxxx: 4052 OR      DX, DX        ; DX will be zero if no symbols input.
xxxx: 4054 JZ      4063          ; Skip move if DX=0.
xxxx: 4056 MOV     SI, 3000      ; SI points to temporary buffer.
xxxx: 4059 MOV     DI, 2B8B      ; DI is user's input area.
xxxx: 405C MOVSB                ; Move one char. from temp. area.
xxxx: 405D CMP     BY [DI-01], 0D ; See if that char. was end of line.
xxxx: 4061 JNZ     405C          ; If not, move another character.
xxxx: 4063 JMP     CX           ; Jump to the code at 0B86h. END

; The above is the main body of the code. It moves each character
; from the original input to a temporary work area. Then it tests each
; character for the single quote mark. If no quote mark is found, it just
; exits to the next routine without doing anything. Otherwise, it jumps
; down here to search for a match with the string between quote marks.

xxxx: 4065 MOV     DX, SI        ; Save input pointer.
xxxx: 4067 MOV     DI, 0001      ; Initialize environment pointer.

xxxx: 406A DEC     DI           ; Adjust for one extra increment (see below)
xxxx: 406B MOV     SI, DX        ; When branching back, restores input.

xxxx: 406D LODSB                ; Inner loop: match input with environment.
xxxx: 406E CMP     AL, 0D        ; See if end hit before closing quote.
xxxx: 4070 JZ      404E          ; If so, skip back to termination code.
xxxx: 4072 CMP     AL, 27        ; Test for user's closing quote mark.
xxxx: 4074 JNZ     408B          ; If no quote, go to 408B to test environ.

xxxx: 4076 MOV     AL, 3D        ; Move an equal sign (=) to AL so can
xxxx: 407B SCASB                ; compare against environment.
xxxx: 4079 JNZ     4095          ; If not an equal sign, not a match.

xxxx: 407B ES:     ; Do if there is a match: move environment's

```

Figure 2: The subroutine that will enable the COMMAND program to substitute values from the environment table for symbols surrounded by single quotation (') marks.

(Figure 2 continues)

```

XXXX:407C MOV     AL,[DI]      ; definition of symbol to TEMP.
XXXX:407E OR      AL,AL        ; Test for end of definition string.
XXXX:4080 JZ      4041         ; If zero, string moved: return to main loop
XXXX:4082 MOV     [BX],AL      ; Otherwise, move character to TEMP.
XXXX:4084 INC     BX           ; Bump the two index registers.
XXXX:4085 INC     DI
XXXX:4086 JMP     407B        ; Continue match loop until zero is reached.

XXXX:4088 CMP     AL,61        ; Come here to test input against the
XXXX:408A JB      4092         ; symbols in environment. These
XXXX:408C CMP     AL,7A        ; instructions will convert
XXXX:408E JA      4092         ; lower-case alphabetical
XXXX:4090 AND     AL,5F        ; characters to upper-case,

XXXX:4092 SCASB                    ; Compares input char. against environment.
XXXX:4093 JZ      4060         ; If char. is equal, go back for another.

XXXX:4095 DEC     SI           ; If not equal, then find next symbol in
XXXX:4096 XOR     CX,CX        ; the environment:
XXXX:4098 MOV     AL,CL        ; For the zero-byte that ends the
XXXX:409A DEC     CX           ; environment entry just tested.
XXXX:409B REPNZ                    ; Search the next 65535 chars. for zero.
XXXX:409C SCASB                    ; (Second half of last instruction.)
XXXX:409D SCASB                    ; Found the first 00, check for another.
XXXX:409E JNZ     408A         ; If not a zero, then check more symbols.

XXXX:40A0 LODSB                    ; Have reached the end of environment, with
XXXX:40A1 CMP     AL,27        ; no match. Skip past the quoted string
XXXX:40A3 JZ      4041         ; and return to top if end quote is found.
XXXX:40A5 CMP     AL,0D        ; If end of line is found, terminate
XXXX:40A7 JZ      4045         ; the procedure.
XXXX:40A9 JMP     40A0         ; Looping until end of line or end quote.

XXXX:40AC [Enter]              ; Press Return after last input.

```

(Figure 2 ends)

-W

On the screen you should see the message, "Writing 4900 bytes." Then quit DEBUG and return to DOS by entering

-Q

The final step is to copy your modified command processor over the old COMMAND.COM. Enter

```
A>COPY COMMAND.TMP
COMMAND.COM
```

The display should reply with "1 file(s) copied." Press Ctrl-Alt-Del to reboot the system, loading the new version of COMMAND.COM, and see whether everything operates normally. If the computer shows any signs of odd behavior, you

probably made a mistake at some point while entering the code. Retrace your steps carefully and try again.

### SET Ready to Go

After you make sure your modifications have done no harm, you can test whether or not they accomplish what you want. First enter the command

```
A>DIR 'COMSPEC'
```

The display should say, "COMMAND COM 18688" followed by the date and time. Now enter this on a single line:

```
A>SET X=Hello. This is proof
that substitution works.
```

After that, enter

```
A>ECHO 'X'
```

and the screen should display the message "Hello. This is proof that . . ."

### An Option for Assemblers

If you have an assembler for your PC, you can use it instead of DEBUG to create the subroutine in Figure 2. With the assembler, you could write a text file of source code, assemble and link it, and then merge the resulting object code into the COMMAND.TMP file, created in Figure 1. If you'd like a printed listing of assembler source code equivalent to the instructions in Figure 2, send a self-addressed, stamped envelope to Environment Code #15, PC Magazine, One Park Avenue, New York, NY 10016. ■



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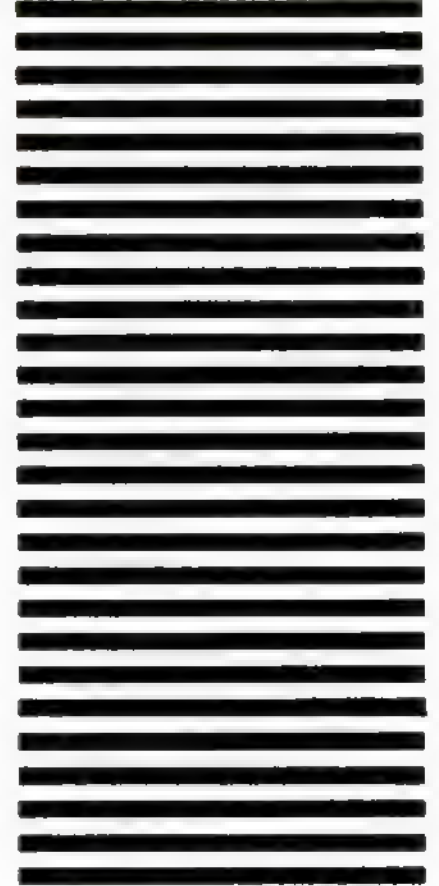
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CIRCLE 531 ON READER SERVICE CARD

EDITED BY PAUL SOMERSON

# User-to-User

PC readers use this forum to help one another by passing along their questions, solutions, comments, and complaints.



*The following three letters are in response to an earlier programming tip. Keep those cards and letters coming in! (Accompanied by disks, of course.)*

## Dueling Calendars

Two popular date processing algorithms that adapt readily from mainframes to PC BASIC are Zeller's Congruence (see J.D. Robertson, "Remark on Algorithm 398, *Communications of the ACM*, Vol. 15, No. 10, 1972, page 918) and Day-of-the-Year (DOY) from the same source. The calendar program in Figure 1 uses these to print a calendar for any reasonable month and year. Mathematically, the calendar goes back to year 0; however, the modern calendar wasn't introduced until 1582 or adopted by this country until 1752.

Zeller's Congruence finds the day of the week (Sunday = 0, ..., Saturday = 6) for any particular date. Inputting month (MTH) and year (YR), and fixing date at 1, I use it to find the weekday (WD) for the first of the month inputted. DOY finds the day in a year (January 1 = 1, ..., December 31 = 365, or 366 for leap years) for any particular date. The program then finds the number of days in the month (NO) by subtracting the DOY for the first of the input month from the DOY for the first of the next month. If, for example, 2-1-1984 is day 32, and 3-1-1984 is day 61, then February 1984 has  $61 - 32 = 29$  days, as it should in a leap year. Remember, leap years are those years divisible by 4, except for century years. A century year must be divisible by 400 to be a leap year.

The weekday found by Zeller's Congruence (lines 220-260) tells the calendar print loop (lines 310-370) which calendar day in the first row is the first of the month. The calendar day, incremented by 1 every time it goes through the loop, then prints consecutively in each column in each row until it equals the number of days in the month (lines 280 and 290). The MID\$ in line 350 strips the leading sign space from the day number and adds the required number of blank spaces to the right of the number to make it print left-justified in the calendar column. There are

```

100 ' ** CALENDAR ** -- by William D. Kraengel Jr.
110 '
120 CLS : KEY OFF : DEFINT A-Z 'initialize & input
130 LOCATE 12,20 : COLOR 10 : PRINT "Enter " : COLOR 2 :
    INPUT "Month & Year (MM,YYYY) ",MTH,YR
140 '
150 MTH$ = MID$("JANUARY FEBRUARY MARCH APRIL MAY JUNE " +
    "JULY AUGUST SEPTEMBER OCTOBER NOVEMBER DECEMBER ",
    9*MTH-8,9) 'extract month
160 '
170 HEAD$="" 'expand header
180 FOR H = 1 TO 15
190 HEAD$ = HEAD$ + " " + MID$(MTH$ + " " + STR$(YR),H,1)
200 NEXT
210 '
220 DAY=1 'Zeller
230 IF MTH>2 THEN ZMTH=MTH-2 : ZYR=YR ELSE ZMTH=MTH+10 : ZYR=YR-1
240 CEN = INT(ZYR/100) : CYR = ZYR-100+CEN
250 WD = INT((13*ZMTH-1)/5) + INT(CYR/4) + INT(CEN/4) - 2+CEN+CYR+DAY+77
260 WD = WD MOD 7
270 '
280 GOSUB 450 : YDO=YD 'days in month
290 MTH=MTH+1 : IF MTH=12 THEN MO=31 ELSE GOSUB 450 : MO=YD-YDO
300 '
310 CLS : LOCATE 7,20 : PRINT " " HEAD$ : PRINT 'print calendar
320 PRINT TAB(20)"SUN MON TUE WED THU FRI SAT"
330 FOR ROW = 1 TO 6 : LOCATE ,20
340 FOR COL = 0 TO 6
350 IF ROW=1 AND COL<WD OR DAY>MO THEN PRINT " " : ELSE PRINT
    MID$(STR$(DAY)+" ",2,5) : DAY=DAY+1
360 NEXT : PRINT
370 NEXT
380 LOCATE 23,10 : PRINT "Press " : COLOR 10 : PRINT "Space Bar " : COLOR 2 :
    PRINT "for next month. Press " : COLOR 10 : PRINT "Esc " : COLOR 2 :
    PRINT "to end."
390 CODE$ = INKEY$
400 IF CODE$ = CHR$(32) GOTO 120
410 IF CODE$ = CHR$(27) GOTO 430
420 GOTO 390
430 END
440 '
450 YD = INT(3055*(MTH+2)/100)+DAY-91 'day of year
460 IF YR=4*INT(YR/4) AND YR<>100*INT(YR/100) OR YR=400*INT(YR/400) THEN LY=1
    ELSE LY=0 'leap year?
470 IF MTH>2 THEN YD=YD+LY-2
480 RETURN

```

Figure 1: Listing of CALENDAR.BAS.

six rows in the calendar to allow for months like September 1984.

The rest is mainly housekeeping to print a nice calendar format and to make the program run smoothly. The MID\$ in line 150 holds the 12 months, each padded to be nine characters long. The calendar month is extracted by a multiple of the month entered in line 130. Then, in lines 170-200, it's concatenated with the year entered in line 130 and expanded by inserting a blank space between each character. The seven calendar days (line 320) are printed as a single string. Note: If your BASIC has an INTEGER DIVISION function, you can use it in several places. When you do, however, be certain the operand never goes above 32767, or you'll get an OVERFLOW error.

William D. Kraengel, Jr.  
Valley Stream, New York

In response to Harry Gross' letter in the April 3, 1984 User-to-User, (PC, Volume 3 Number 6) I am submitting a program I have been using for several years that calculates the day of the week for any date input, so long as it is a valid Gregorian date in mm/dd/ccyy format. The original subroutine was written in IBM-370 Assembler language, and I have translated it to PC BASIC (see Figure 2).

This subroutine is based on the fact that the entire Gregorian calendar repeats every 400 years. The reference date for the Gregorian system can be thought of as Sunday, January 1, 0000. By assuming this, you can easily calculate the weekday for any date.

Each century past the last 400-year cycle causes the day of the week to be offset by 5 full days past the reference day. Similarly, each leap year past the start of

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## USER-TO-USER

```

100 ' WEEKDAY.BAS -- by John A. Schweisthal -- Software Consulting Service
110 '
120 ' NOTE: Only valid GREGORIAN dates are assumed on input.
130 '
140 DIM FFTBLX(12) 'Reference month 1st day offsets
150 DIM DAYTB$(7) 'Table of day names
160 '
170 ' Following data are offsets from Sunday of 1st day of reference months
180 '
190 DATA 0,3,2,5,0,3,3,1,4,6,2,4
200 '
210 ' Following are the names of the days of the week
220 '
230 DATA Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday
240 '
250 INPUT "Enter the date in mm/dd/yyyy format: ",INDATES
260 GOSUB 300
270 PRINT "day is ";ANSWER$
280 END
290 '
300 RESTORE 190 'Point to reference offsets
310 FOR IX = 1 TO 12 'Loop on number of months
320 READ FFTBLX(IX) 'Fill in next offset number
330 NEXT IX 'Process next one if any more
340 '
350 RESTORE 230 'Point to days of the week
360 FOR IX = 0 TO 6 'Sunday=0, Saturday=6
370 READ DAYTB$(IX) 'Fill in next day name
380 NEXT IX 'Do next day if more left
390 '
400 LET MX = VAL(LEFT$(INDATES,LEN(INDATES)-8)) 'Get the month in date
410 LET DX = VAL(MID$(INDATES,LEN(INDATES)-6,2)) 'Get day of the month
420 LET YX = VAL(RIGHT$(INDATES,4)) 'Get the year in date
430 IF MX < 3 THEN LET YX = YX-1 'Adjust year for JAN or FEB month
440 LET DX = DX + FFTBLX(MX) 'Add in the offset for reference month
450 LET CX = YX \ 100 'Compute the century in the date
460 LET YX = YX MOD 100 'Compute year (not century) in date
470 LET RX = YX MOD 4 'Nbr regular years since last leap year
480 LET CX = CX MOD 4 'Nbr centuries since last 400-yr cycle
490 LET LX = YX \ 4 'Leap years since start of century
500 '
510 ' Now, compute the day of the week offset from Sunday by adding all the
520 ' corrections based on 400-year cycle repetition and the offsets
530 ' due to each regular year and leap year since last 400-yr cycle.
540 '
550 LET DX = (DX + RX + (5 * (LX + CX))) MOD 7 'Index to day names table
560 LET ANSWER$ = DAYTB$(DX) 'Fill in the name
570 RETURN

```

Figure 2: Listing of WEEKDAY.BAS.

the last century also adds a 5-day offset. Each regular year (non-leap year) since the last leap year adds a 1-day offset. Thus, if June 16 is a Thursday one year, it will be a Friday the next year if the next year is a regular year.

The algorithm adds these offsets to the reference and to the day of the month of the input date to produce a total offset caused by how far past the beginning of the last 400-year cycle the input date is. Unfortunately, there is still one small problem: Since each month has a varying number of days, an adjustment factor must be added to account for any offset added due to which month it is within the year. The table of 12 numbers in 'FFTBL%' contains these factors.

The assumption that January 1, 0000 was a Sunday (day zero) allows us to find

the reference DAY-OF-THE-WEEK for each of the other months at the beginning of "time." Also, because of the problem of leap years, March through December references are projected BACKWARD to year minus one (-0001).

Finally, after adding in all the offsets for the reasons given above, the sum is divided by 7 to yield a remainder between 0 and 6. This is then used as the index into the table of weekdays in order to obtain the correct day.

John A. Schweisthal  
Silverton, Oregon

The program in Figure 3 extends the calendar starter program that appeared in the April 3, 1984 issue of PC. It determines the day of the week for the first day of any month in any year and prints the calendar



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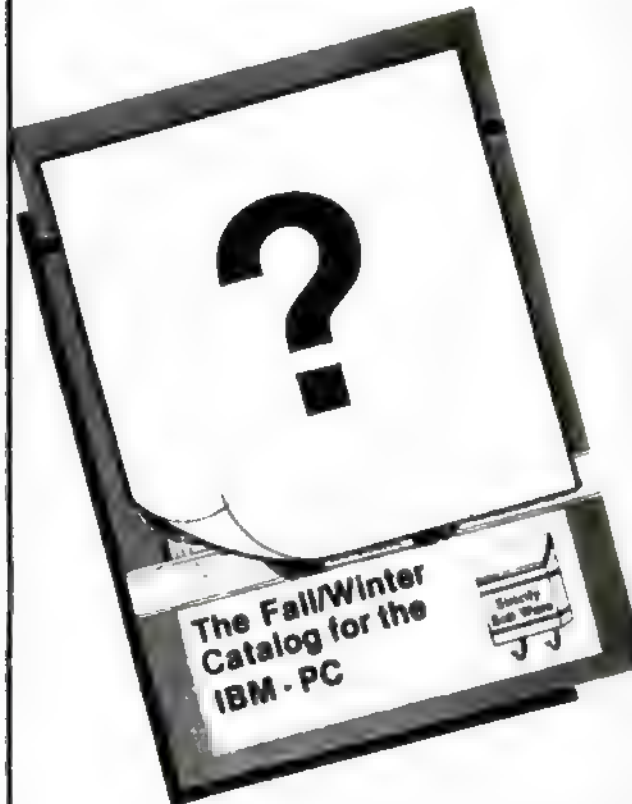
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## USER-TO-USER

```

100 ' CALENDAR - by Tsoung-Chao Lee
110 CLS:KEY OFF:SCREEN 1:COLOR 9
120 DIM A$(12),A(42)
130 DATA January, February, March, April, May, June
140 DATA July, August, September, October, November, December
150 FOR I=1 TO 12:READ A$(I):NEXT I
160 INPUT "Enter month (1 to 12)";M
170 INPUT "Enter year";Y
180 MON=M:YEAR=Y:L=31
190 IF M=4 OR M=6 OR M=9 OR M=11 THEN L=30
200 IF M=2 THEN L=28
210 IF Y/4=INT(Y/4) AND Y/100<>INT(Y/100) THEN LEAP=1
220 IF Y/400=INT(Y/400) THEN LEAP=1
230 IF M=2 AND LEAP=1 THEN L=29
240 IF M<3 THEN M=M+12:Y=Y-1
250 N=(3+Y+2*M+INT((3*M+3)/5)+INT(Y/4)-INT(Y/100)+INT(Y/400)) MOD 7
260 IF N=0 THEN N=7
270 FOR I=N TO 42:D=D+1:A(I)=D:NEXT I:CLS
280 LOCATE 6:PRINT TAB(18-LEN(A$(MON))/2);A$(MON);YEAR:PRINT
290 PRINT TAB(8);"Sun Mon Tue Wed Thu Fri Sat":PRINT
300 FOR I=0 TO 5
310 FOR J=1+I*7 TO 7+I*7
320 IF A(J)=0 OR A(J)>L THEN 340
330 PRINT TAB(3+4*(J-I*7));A(J);
340 NEXT J
350 PRINT:PRINT:NEXT I
360 LINE (30,20)-(290,170),2,B
370 END

```

Figure 3: Listing of CALENDAR.

for the month specified.

The program finds the day of the week for March 1 with the formula

$$(4+Y+\text{INT}(Y/4)-\text{INT}(Y/100)+\text{INT}(Y/400)) \text{ MOD } 7,$$

where Y is the year, then adjusts the days later in the week for the first day of each month by the function

$$(2*M-1+\text{INT}((3*M+3)/5)) \text{ MOD } 7$$

where M is a month from 3 to 14. January and February are internally changed to months 13 and 14 of the previous year since the adjustment is based on the last March 1.

The change is for easy programming because the pattern of days in March through February forms five-month cycles with a broken end of 28 or 29 days for February. The determination of the day for March 1 considers that it is a day later than the day of a previous year (and thus a linear function of Y) except after a leap year, when it is 2 days later. The term

$$\text{INT}(Y/4)$$

increases by one every four years, and the terms

$$-\text{INT}(Y/100)+\text{INT}(Y/400)$$

adjust for the leap century.

This program is a perpetual calendar and prints a calendar for any month in any year under the Gregorian calendar system. The program also may be used to find the hypothetical Gregorian calendar month for the Julian calendar period (prior to October 15, 1582.) It is interesting to note that Gregorian October 15, 1582 is Julian October 5, 1582—there are 10 days missing! (You must be sure to delete statements 110 and 360 if you do not have a graphics board.)

Tsoung-Chao Lee  
Mansfield Connecticut

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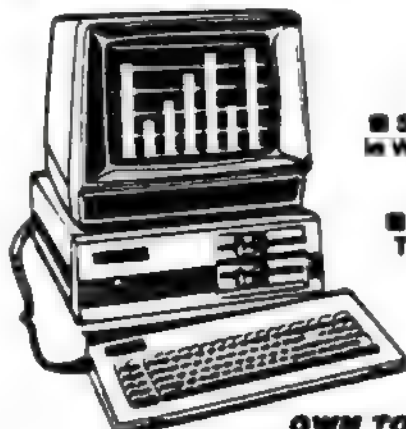
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MARK ZACHMANN

# PC Tutor

## Shift It Again

**Q:** I was overjoyed to see your answer to "Beyond the Horizontal" (PC, Volume 3 Number 3, page 453). You pointed out,



"If you want your display to come up with 80 columns shifted two characters to the right, you can include this line in your AUTOEXEC.BAT file: MODE 80,R,2."

I tried this, but nothing happened. What's up?

Camilo Quelquejeu  
Panama City, Panama

**A:** Whoops! That was my shorthand for *MODE 80,R twice*. Your *AUTOEXEC.BAT* file should include two lines:

```
MODE 80 , R
MODE 80 , R
```

*and that should solve the problem.*

## Controlling Keywords

**Q:** Occasionally, after something else has already gone wrong, my XT's keyboard slips into a BASIC keyword mode. I cannot determine how to make the keyboard return to its normal mode. I'd also like to know how to put the keyboard into BASIC keyword mode deliberately—it would be a useful feature.

Jack Calloway  
Orlando, Florida

**A:** The mysterious mode you encounter occurs when a program manipulates the keyboard flag (a byte of data in the BIOS area) but neglects to reset the flag.

To fix the problem, just tap the Alt key, which should reset the questionable bit in that flag. If you want to enable the BASIC keyword mode (or Alt mode), type:

```
DEF SEG = 64 : POKE 23,8
```

This will produce the same results as if you pressed the Alt key. You can turn off this mode by tapping the Alt key itself.

## Mixing Monitors

[Editor's note: When the following question appeared in PC, Volume 3 Number 11, page 442, part of the answer was omitted. For your convenience, we are reprinting the complete question and answer.]

**Q:** I own an NEC 1201M green display, which accepts a composite signal from my IBM PC's color/graphics adapter.

I'd like to take advantage of word processing programs that do on-screen underlining, but the underlining won't show up because I use the color/graphics adapter. If it is feasible to change the display's input from a composite video signal to the TTL signal, would I be able to install a monochrome board to get underlining and better text resolution? Can I do this without having to invest in another monochrome monitor in addition to the new display board?

Wayne Lau  
Seattle, Washington

**A:** It really isn't feasible to plug the IBM monochrome board into anything but a display designed for the card—an IBM monochrome monitor or a workalike. Since the monochrome and color/graphics boards run at very different speeds, and the monochrome board has separate sync and video outputs, you would have an

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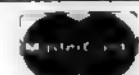
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## PC TUTOR

*awful task in front of you.*

*The monochrome board runs at a horizontal frequency of 18.7 KHz, while the color display runs at 15.75 KHz. If you connect these devices and mix up these frequencies, you usually will get a loud whining noise. Even worse, if you plug the color/graphics adapter into the monochrome monitor, the monitor will soon be producing smoke as its output (while you will be generating an expensive repair bill as your input).*

*You say that underlining doesn't appear on your display. When the color/graphics card has color enabled, the underlining is colored blue. Since you're using a green-on-black display, the result is that you can't see the underlining.*

*If you invest in a color display to use with your color/graphics adapter, you'll be able to distinguish underlining, even though you won't get the IBM monochrome board's superior character set. Text on a higher-resolution color display should be more attractive than it is on your NEC 1201. With a color display, you can work with text in colors that are easier on the eye than white or green on black. I recommend trying yellow on black.*

### PRINT USING Abuses Values

**Q:** I uncovered a situation that I couldn't understand when I used Advanced BASIC and PC-DOS 2.0. The BASIC program listing and sample run shown in Figure 1 illustrate the problem.

The PRINT USING statement seems to change the value stored in variables so that the VAL function doesn't evaluate these variables as I would expect. This happens only with string, not numeric values.

Have I found a bug or a feature?

Glen L. Steinbach  
Lutherville, Maryland

**A:** It looks like a bug to me—one that didn't occur in Advanced BASIC for PC-DOS 1.1. In addition, whenever you enter a nonnumeric string value for X\$ at line 30 in Figure 1, the VAL function will return a nonzero value, even after the program

loops back to line 30. The bug seems to be in the VAL routine, since the value of the X\$ variable is unchanged.

When bugs like this turn up in a language, users feel aggravated. For example, they raised an incredible brouhaha when the IBM PC first came out because its BASIC's PRINT USING routines would lose a decimal point in about one out of 10,000 occasions. I must acknowledge, however, that the IBM PC has the most robust, bug-free software ever provided for a microcomputer. Each month I usually hear new reports of only one or two true bugs in PC-DOS, BASIC, and all the other PC programs from IBM.

### A Displaywriter Dilemma

**Q:** I'd like to use my IBM Displaywriter 5218 daisy wheel printer with my IBM PC (a model with 256K). I've already installed an asynchronous adapter card in the PC and made a cable for the printer, following some pin specifications [see Figure 2] that were provided by a friendly IBM systems engineer.

I still haven't managed to get the 5218 to print anything in response—not even nonsense. I suppose some handshaking is involved. Is there a program I can write to get the PC and printer to communicate?

Ann Adams  
West Newton, Massachusetts

**A:** The first thing you must do is rearrange the shunt module on the asynchronous adapter board, which is originally set for RS-232 use. The shunt module is located at the lower right of the board, near the 25-pin connector. Pull this module out of its socket, turn it upside down and plug it back in.

Next, you should either disable the PC's handshaking signals or make a connection that's correct for the Displaywriter's printer. One way is to connect pins 5, 6, 8, and 20 on the 25-pin connector at the PC's end of the cable.

This should take care of the cable. Try to print now. If any output appears—even garbage—you've made progress. It's pos-



sible, however, that the PC's asynchronous board might not be able to communicate with this printer at all.

I don't have a Displaywriter system on hand, but I can anticipate several problems that you might have to deal with. The Displaywriter's printer may need to do some handshaking, sending the PC some information that the computer might be able to trap, but doesn't do so in normal use. Also, the Displaywriter printer, like most of IBM's non-PC devices, probably speaks EBCDIC rather than ASCII codes. If that's the case, you'd need an ASCII-to-EBCDIC translator for your serial I/O

port. In addition, the printer might use a nonstandard asynchronous protocol, which would require you to do extensive reprogramming before the ports could communicate.

If anyone has managed to link a PC to a Displaywriter's printer—or can show why it might be impossible—please write. ■

The PC Tutor solves practical problems and explains points of general interest. If you'd like to see your questions answered here, drop a line to PC Tutor, PC Magazine, One Park Avenue, New York, NY 10016.

```
10 FMT$ = "      ## \      \"
20 A = 10 : AS = "sample text"
30 INPUT XS
40 PRINT "The variable XS is: "; XS
45 PRINT "Test the value of XS:"
50 IF VAL(XS) = 0 THEN PRINT "Value is zero"
   ELSE PRINT "Value is not zero"
55 PRINT "Print A and AS using format:"
60 PRINT USING FMT$,A,AS
65 PRINT "Test the value of XS again:"
70 IF VAL(XS) = 0 THEN PRINT "Value is zero"
   ELSE PRINT "Value is not zero"
80 PRINT
90 GOTO 30
```

```
run
? asdf
The variable XS is: asdf
Test the value of XS:
Value is zero
Print A and AS using format:
      10 sample text
Test the value of XS again:
Value is not zero
```

Figure 1: An Advanced BASIC program listing and a sample run of the program that illustrate a bug involving PRINT USING in Version 2.0.

9-pin connector (at printer end)	PIN #	:	PIN #	25-pin connector (at PC end)
+ transmit data	1	:	18	+ receive data
- transmit data	2	:	25	- receive data
receive shield	5	:		no connection
transmit shield	6	:		no connection
+ receive data	8	:	9	+ transmit data
- receive data	9	:	11	- transmit data

(Note: PC Tutor suggests connecting pins 5, 6, 8, and 20 on the 25-pin connector at the PC end.)

Figure 2: The pin chart used by Ann Adams to connect an IBM PC to an IBM 5218 Displaywriter printer.

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# A Publisher's Circulation File

Small publishers can take advantage of microcomputers and database programs to build circulation management files that are tailored to postal service requirements.

**M**aintaining subscriber files for a publication's circulation is a prime reason small publishers purchase a microcomputer. But before a publisher can implement an efficient circulation file, he must carefully analyze what information must be included and select a software program appropriate to his needs.

Circulation files contain a wide variety of subscriber-related data, including mailing addresses, payment records, and certain personal facts about the individual subscriber. To capture this information, publishers often try a good mailing list program, but these programs often restrict the choice of fields to simple name and address formats and limit the number of code fields that the list can be sorted by. Database management software is often a better solution for managing a circulation file. It can support hard disk storage, indexing on multiple key fields, and flexible reporting and label printing.

To understand why you need such a powerful system, it is helpful to take a look at the many elements of creating a circulation management program.

## File Structure

First you must collect information essential to mailing the publication to the reader, including first name, last name, title, company name, address, city, state,



zip, and zone. Publications that mail to consumer audiences will not require fields for title or company name, but if the publication is mailed to many individuals at their business addresses, these fields will be essential. The zone field is used to define which of a possible eight postal zones a reader is in. Its purpose is to create zone reports for the postal service.

Many publications like to gather statistics on their readership both for advertising promotion and to gather a specific profile of the readership to help shape the editorial product. This type of information is usually collected on a subscription or qualification card.

The process of collecting data on occu-

pation, buying habits, size of company, and so forth is best handled by creating one or two character code fields. In searching or counting data, a simple code, such as 01 for Company President, will allow consistent entry and eliminate mismatches from entries such as Co. President and Company Pres.

The number of code fields depends on the amount of data to be collected. For illustration's sake I'll use two code fields: occupation code and industry code. The next group of fields will establish when the subscription begins and ends, and, if it is a paid subscription, the amount paid and the length of term.

The term can be coded according to number of issues or years. The starting and ending dates can be date fields, and the amount collected on the subscription can be designated as a dollar field. The subscription term might include these details: subscription starts, subscription ends, term, amount paid and date paid.

Paid subscribers may wish to be billed at a later date rather than enclosing payment with the card. A simple solution to the "bill me" subscriber is a date paid field. This way the subscriber is sent a bill for the amount of the term, and the date field remains empty until payment is received. You could also use the amount paid field, but for accounting purposes, the date paid will establish which sub-



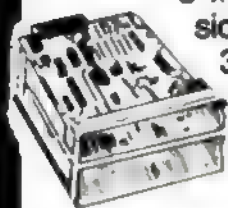
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## WRITING

scribers are to be appropriated into the accounting cycle.

### Key Fields

Circulation files are usually large, and although the number of fields should be kept to a minimum, many fields are needed for sorting purposes.

In the circulation field I've described here, you would need to count, search or sort by the last name, zip code, zone code, occupation code, industry code, subscription starts, subscription ends, term, amount paid, and date paid fields. Since many database programs have a limit on how many key fields may be active at one time, you should choose one that allows as many key fields as possible to be active.

Certain programs allow for multiple key fields but also allow these fields to be activated or deactivated at any time. This feature is useful for creating seldom-used counts or reports. For example, zip code and last-name fields may be used constantly for subscriber lookup, while occupation codes may be used only for special reports. By activating the key field only when needed, a program will be able to index records faster.

Once you've established the basic fields for the circulation file, mailing labels, reports and counts, and invoices for "bill me" and renewal subscribers can be printed. But before you can begin, there are a few other factors that will affect how you set up your circulation file.

To obtain the lowest postal rates for a publication, you must conform to strict requirements established for publications seeking to mail at second- or third-class postal rates. Doing so will save you a substantial amount in postage. For example, postage for a 6-ounce publication mailing at first-class rates would cost \$1.05. At second-class rates, postage for the same magazine might be as low as 13¢. To qualify for these rates, the publisher must structure circulation files to conform to the postal service's rules.

For instance, most newsletters are mailed at first-class rates; a publisher can save

money by presorting first class mail, which requires that the circulation file be sorted by zip code, and that the mail be bundled by zip code series, city, or state.

### Mailing Rates

Many magazines mail at low, third-class (bulk) rates. The same zip code sort and bundling procedures apply here too, even though these publications will take much longer to reach their destinations.

The most demanding postal requirements, however, are for magazines mailing at second-class rates. This rate, com-

**The most  
demanding postal  
requirements are for  
magazines mailing  
at second-class  
rates.**

monly referred to as "controlled circulation," offers the publisher rates slightly lower than third-class, but with expeditious handling. This means the magazines mail at the lowest rates possible but take a week or two to reach the subscriber.

To qualify for controlled circulation rates, the publisher must prove to the postal service that at least 50 percent of those receiving the publication have requested it by a paid subscription or written request within the last 3 years. Once established, the publication's contents are divided into editorial advertising content, and you'll pay a premium rate for the mailing weight of the advertising and a minimal rate for the weight of the editorial.

To provide the postal service with this information, the circulation file must indicate which readers have requested the publication and when they did so. In addition to computer records, publishers must keep the actual written requests or subscription cards since the postal service may actually audit the circulation file. (continued)





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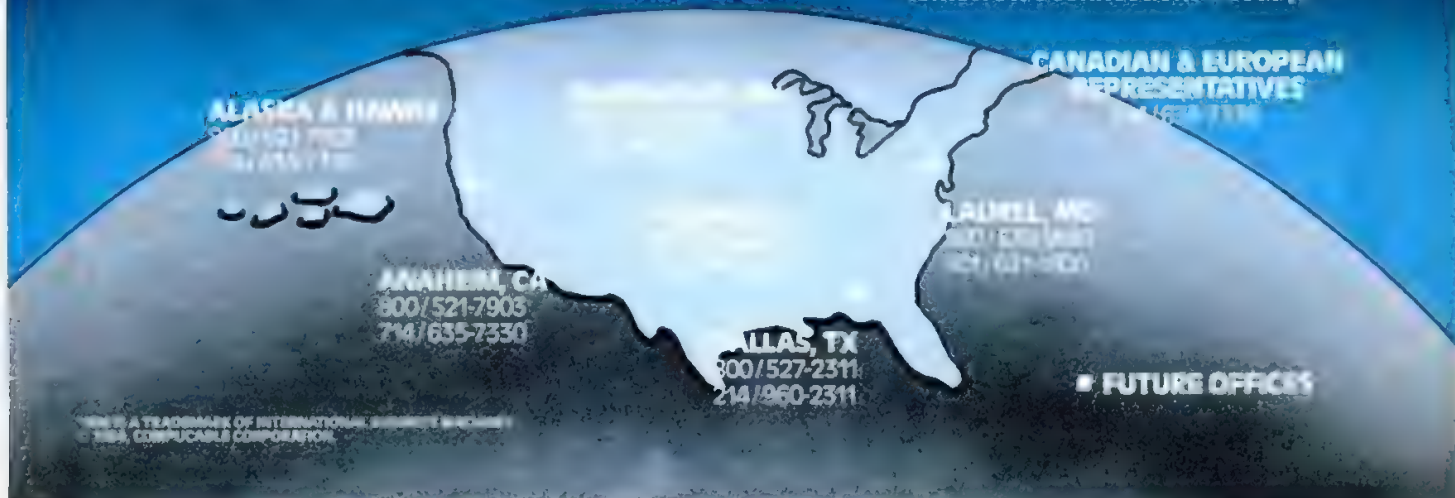
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A publisher must prepare various reports for the postal service, but it is also essential to be able to count records without running through the time-consuming report process. The publisher needs a program that is sophisticated enough to accommodate a complex circulation file, but at the same time will allow a simple query to produce a simple numeric answer. ■

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### Columns

Editor's Wire by Corey Sandler; Junior Explorer by Peter Norton; Screen Play by Don Kennedy; Opinion by Lindsay Van Gelder and Stephen Manes; Education by Martin Porter; Logo by Winn Rosch; BASIC by John Woram; Communications Networks by Eric Freedman; Reader to Reader by Paul Somerson.

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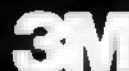
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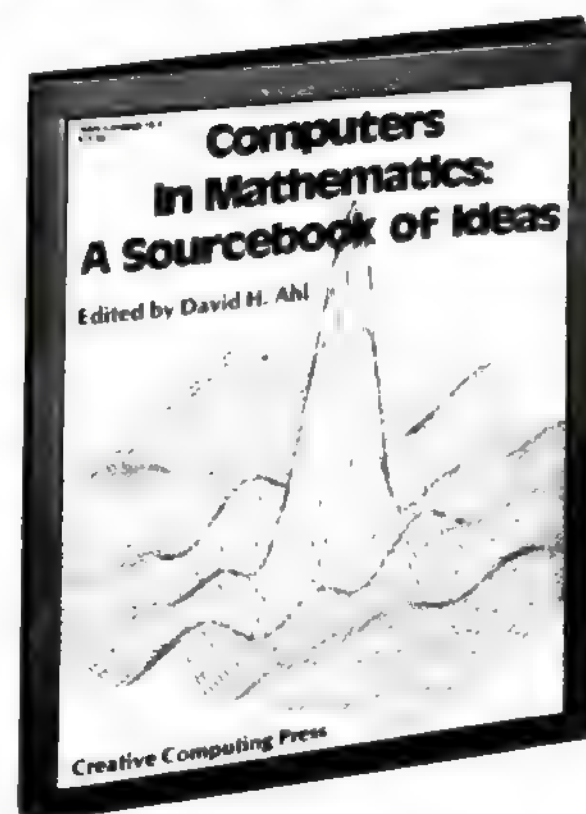
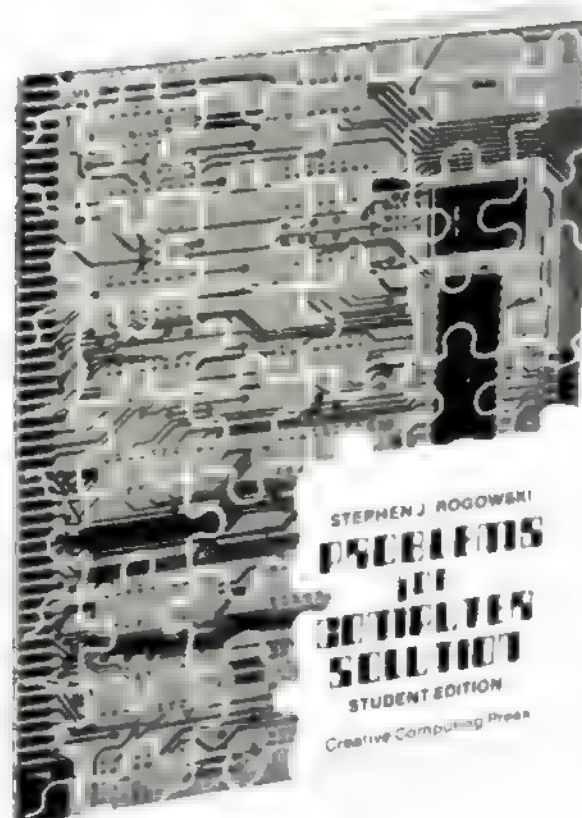
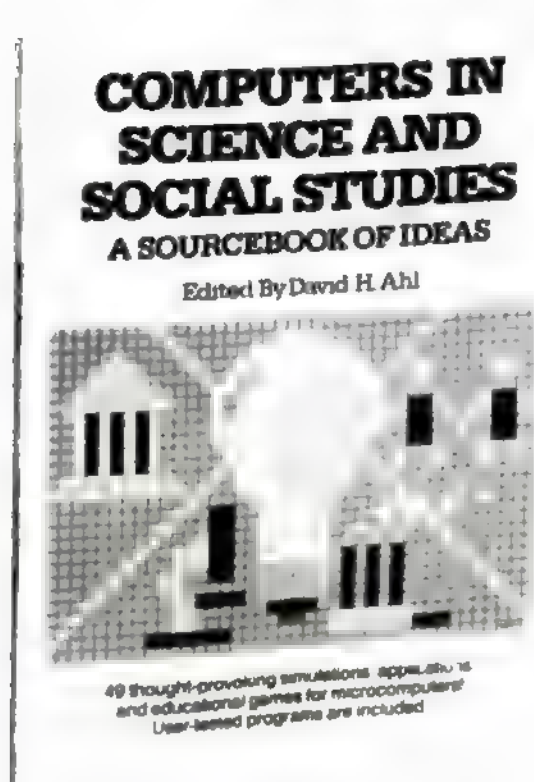
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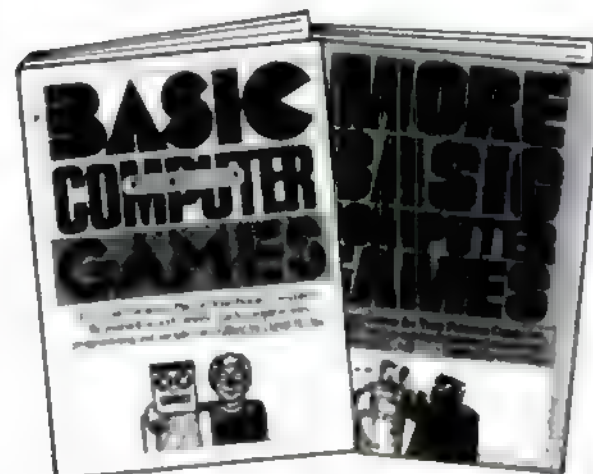
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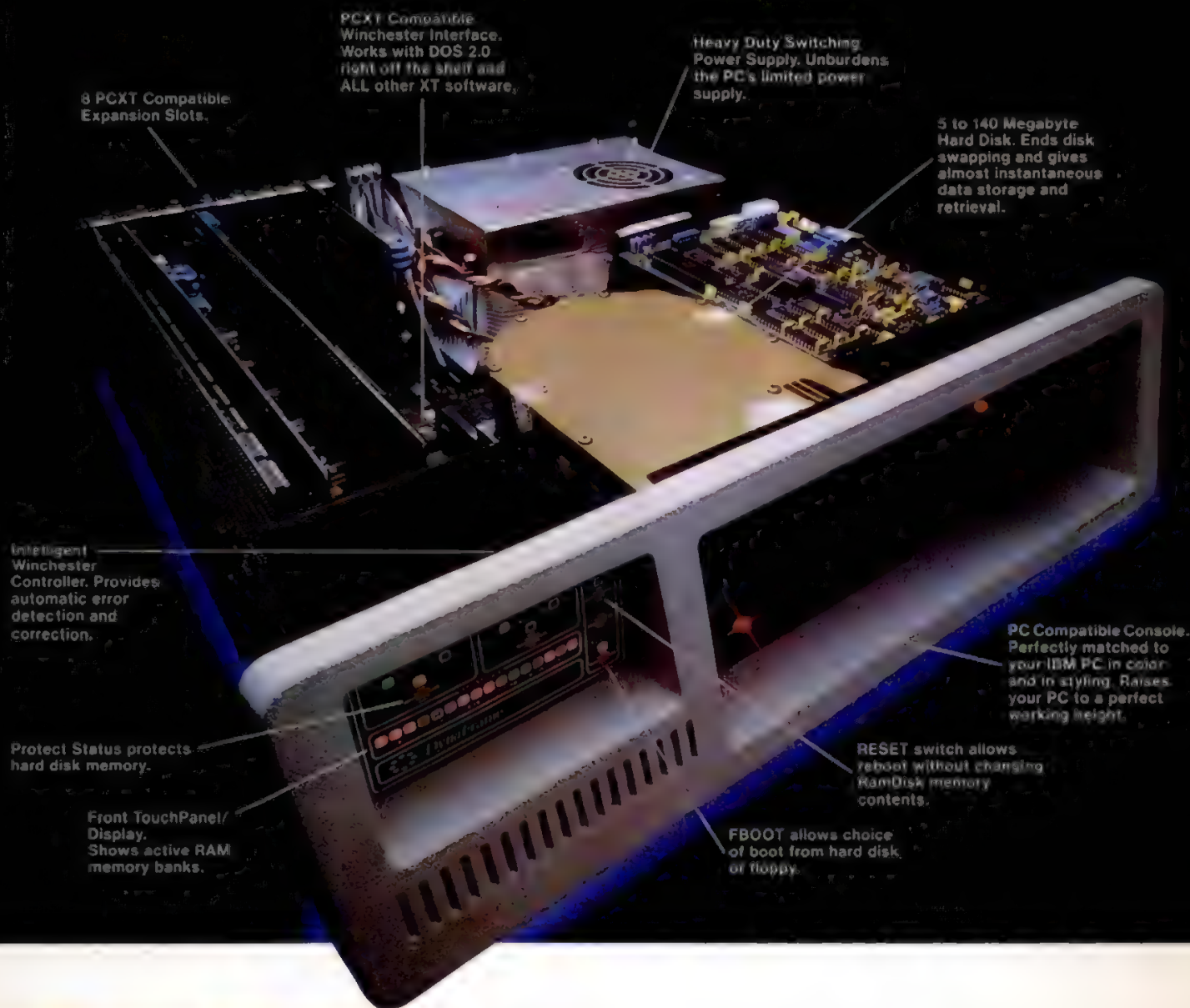
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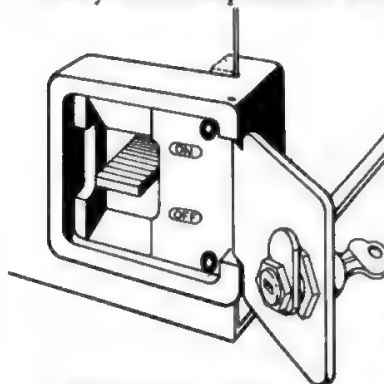
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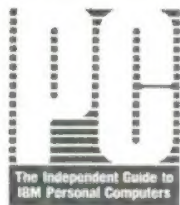
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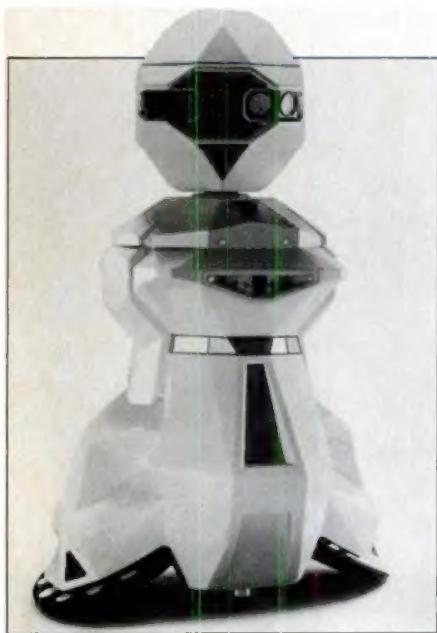
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# Coming Up



## Process Control

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## Project: Database, Part 6

This sixth article in the ongoing series reviewing DBMS packages looks at Category 3, *dBASE II*-type databases. More sophisticated than the second category of databases, these packages can handle more than one file at a time, feature a query language, and can be programmed. In this issue, we'll review *dBASE II*, the de facto standard of DBMS packages, and look at some other packages that challenge that standard.

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## Monroe 2000, Tandy 2000

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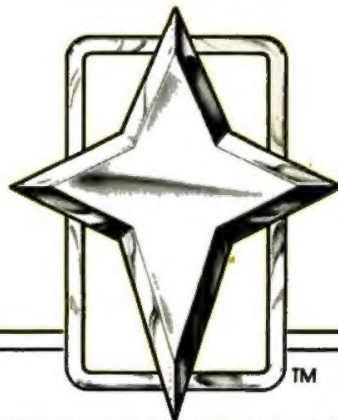
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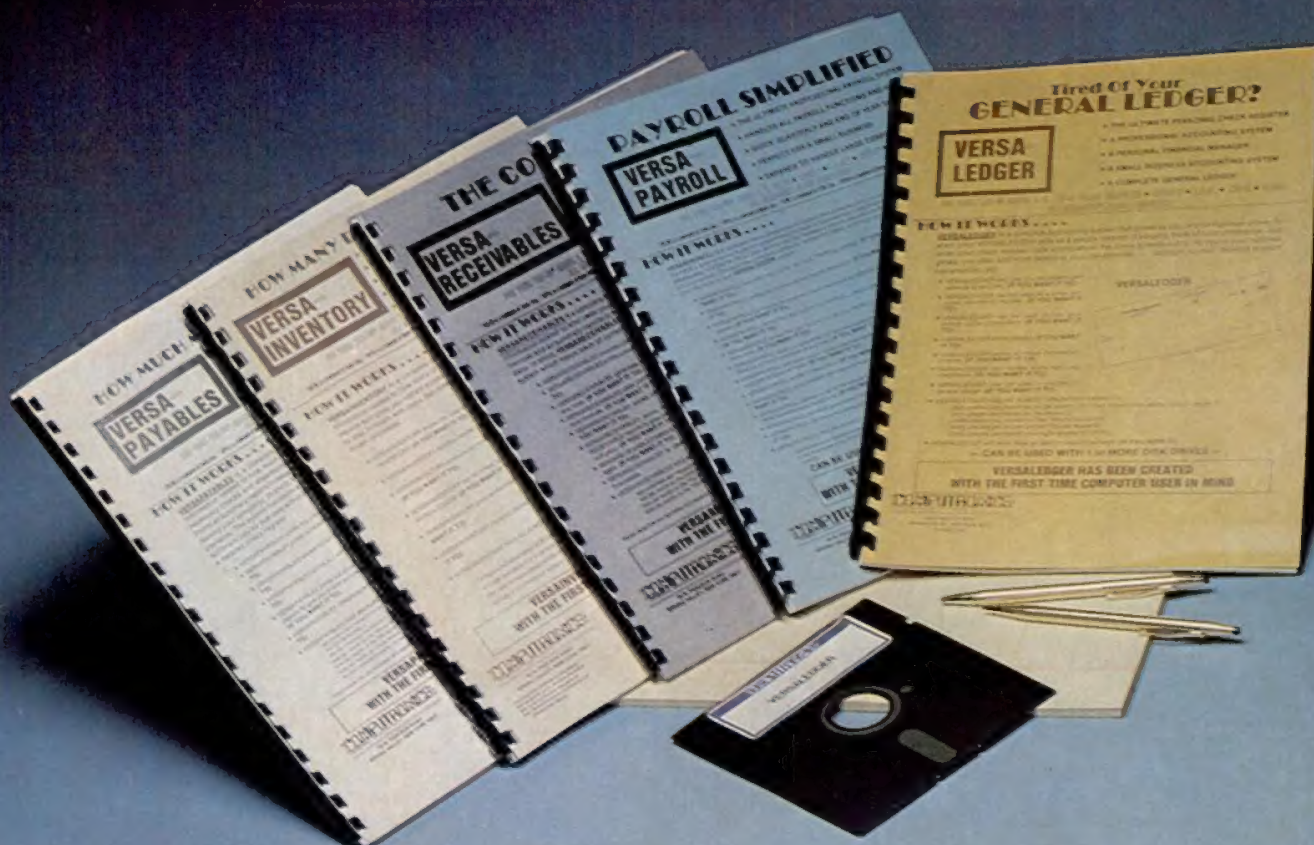
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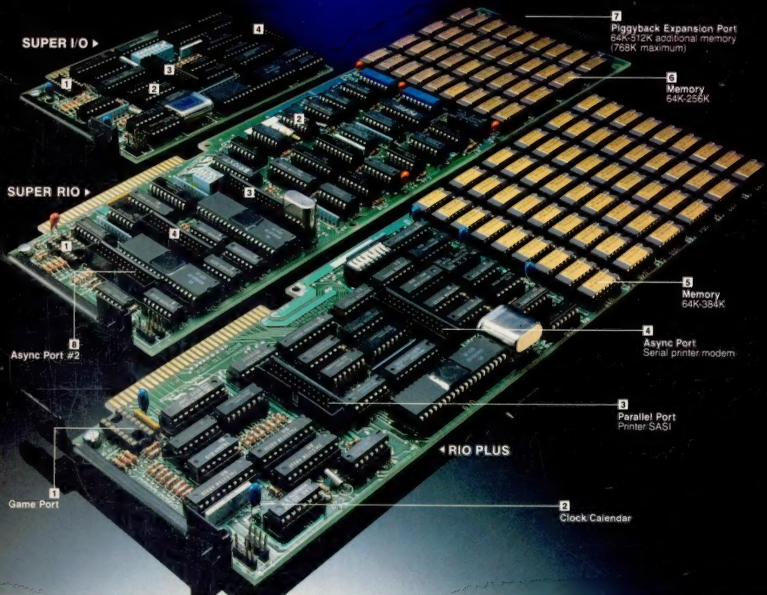
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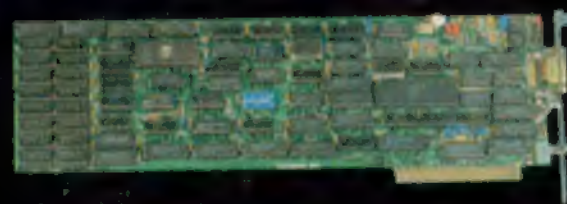
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